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SCIENCE FICTION AND FACT

JUNE 1994

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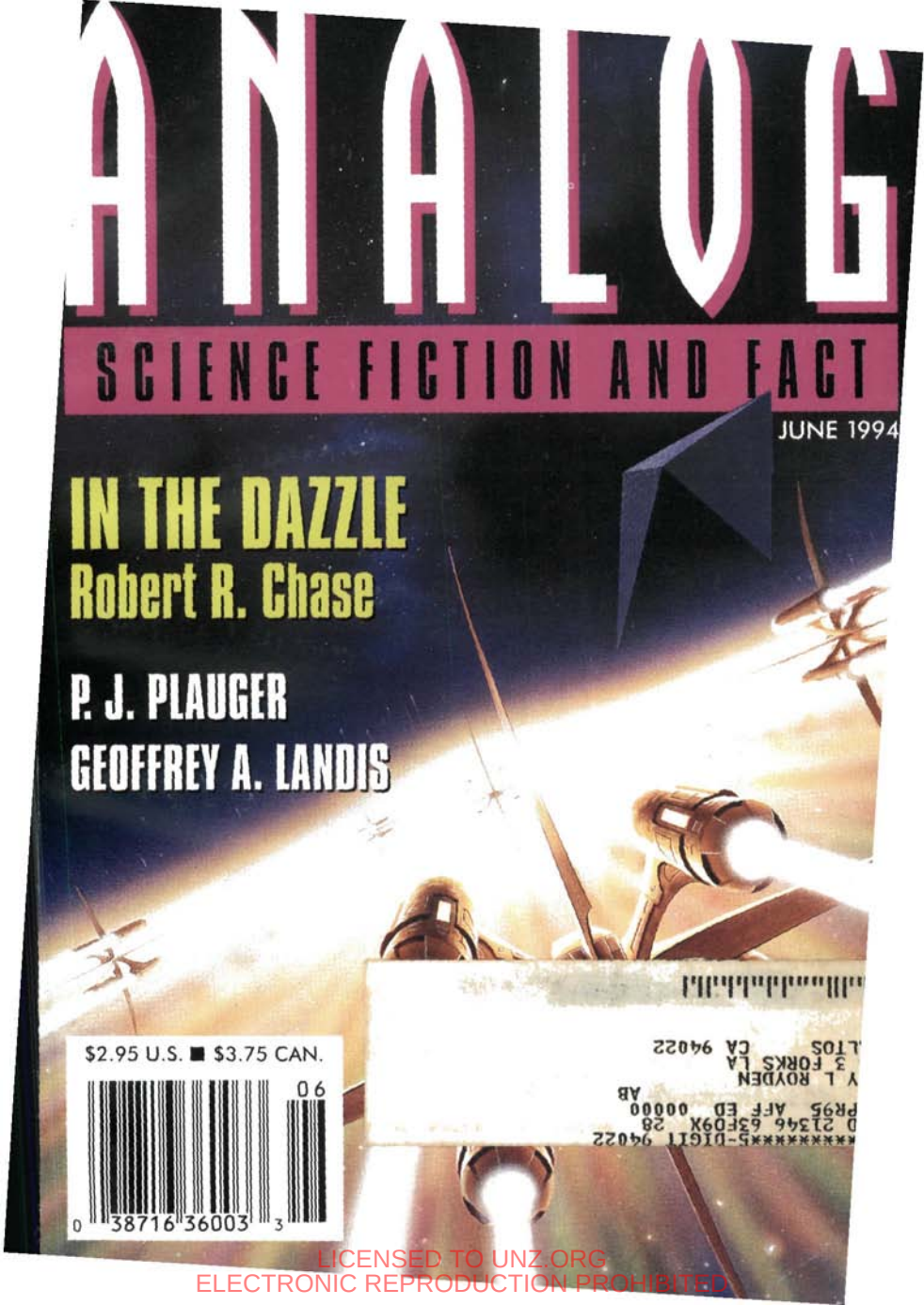

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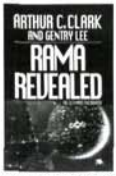

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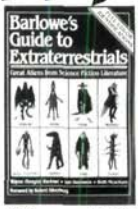

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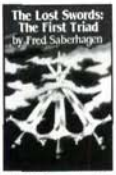

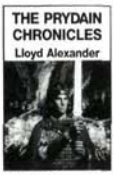

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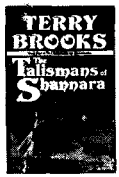

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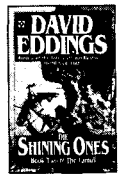

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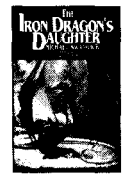

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EDITORIAL Stanley Schmidt

AUTHENTICITY

It often seems that the many "isms" with which we are constantly bombarded are chosen more for their euphony and emotional connotations than for their actual meaning as deduced from their use. I was recently reminded of a good example when I read that the "preservationists" who have appointed themselves guardians of New York City's Grand Central Terminal were again up in arms. This time their complaint is a plan to install a high-definition television system in the main concourse, which they say would clash with the original design and distract people's attention from the architecture of the building itself.

By the time you read this, this particular controversy may have been resolved one way or the other. Which way is not important to my argument; its only significance is that it's the latest *example* to provoke my thoughts on the subject. It is not the first. Grand Central has for at least the last couple of years been undergoing a systematic program to eliminate elements not perceived as part of its original plan and thereby restore the building, admittedly of strong historic and architectural interest, to its "authentic" state.

But what *is* its authentic state? And how are all its other states *less* authentic?

One of the "intrusive" elements that has already been removed is the Kodak Colorama. In case you never saw it, it was a huge color transparency—the biggest I've seen, and possibly the biggest ever made—mounted on a light box at one end of the main concourse. How huge? Eighteen feet high and 60 feet wide. It was not always the *same* transparency; every few weeks the picture was replaced by a completely new one. The subject matter varied widely, from landscapes rural and urban to sports action scenes, from aerial vistas to undersea panoramas.

The decision about how to "restore" the terminal was evidently made by people who agreed with the view expressed in *The AIA Guide to New York City*, produced by the New York Chapter of the American Institute of Architects in 1988: "The main room inside is unexpectedly spare in

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detail, a virtue now obscured by advertising displays, particularly that colossal Kodak transparency and its surrounds that **must go** in any intelligent refurbishing."

Well, it's gone now; but I would hope that any objective reader of that sentence now would recognize it as a statement of opinion, not fact. Whether unexpected spareness is a "virtue" depends on taste, and tastes differ. Remember that the authors of the *AIA Guide* are architects, so it's hardly surprising that they would consider the building's architecture more important than anything else. It does not follow that everyone else shares or should share their priorities. (If we really wanted nothing to distract from the architecture of GCT, maybe we should get rid of the trains!)

Personally, I'm interested in architecture, but I'm more actively interested in photography. The Colorama pictures, from my photographer's point of view, were usually most impressive pieces of work, both as photographic art and as examples of photographic technology and technique pushed way beyond their usual limits. (If you're a photographer, you can imagine the problems involved in making a high-quality enlargement that big, especially from a moving subject!) Sure, they were ads for Kodak—there was a Kodak logo next to (but much smaller than) the pictures—but they were also, and in my view primarily, *photographs* that deserved a lot of respect on several levels.

The first time I visited New York City, 30 years ago, the Colorama was one of the most striking and memorable things I saw. Later, when I began commuting regularly through Grand Central, the change to a new picture was usually a small highlight of my month. Now that it's gone, I'll agree that the architectural essence of the building is more obvious than before; but I also think the concourse is, on the whole, a drabber and drearier place than it was. New York on a gray winter day *needs* an occasional burst of color that shouts a reminder of places that *don't* look like New York on a gray winter day.

Was it a worthwhile trade? I don't know. Obviously *I'm* not convinced, but I'm sure the *AIA Guide* authors must be happier now. I haven't seen any attempt to determine a general consensus among the thousands of people who *use* the station.

Is the station we now have, with

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the Colorama gone and HDTV still being fought over, more "authentic" than the one of five years ago? Not that I can see. It merely looks, in certain respects, more like it did during one particular phase of its earlier history. But why should *that* be considered a virtue?

The point seldom mentioned in discussions about what Grand Central should look like is that the station is, in an only slightly figurative sense, a living, functioning thing. It has been that for a long time, and still is now. Its primary *raison d'être* has never been to stand there and be admired as a work of art, but rather to bring trains and riders together. It's to be *used*, and people are still using it. Like any living, functioning thing, it has constantly evolved. A GCT with the Colorama is just as authentic, though representative of a different period, as one without.

The "preservationists" say they are "restoring" the station to What It Was Meant To Be. To somebody like me, who has watched them remove one of the most distinctive features the station has had for the entire time I've known it, what they've done looks more like destruction of its "natural" state. Neither view is strictly accurate, of course. The truth of the matter is that Grand Central has been there for eight or nine decades (the *AIA Guide* gives the "date of completion" as 1903-1915), and for approximately half of that time the Colorama wasn't one of its prominent characteristics, and for another half it was. (It began operation in early 1950.)

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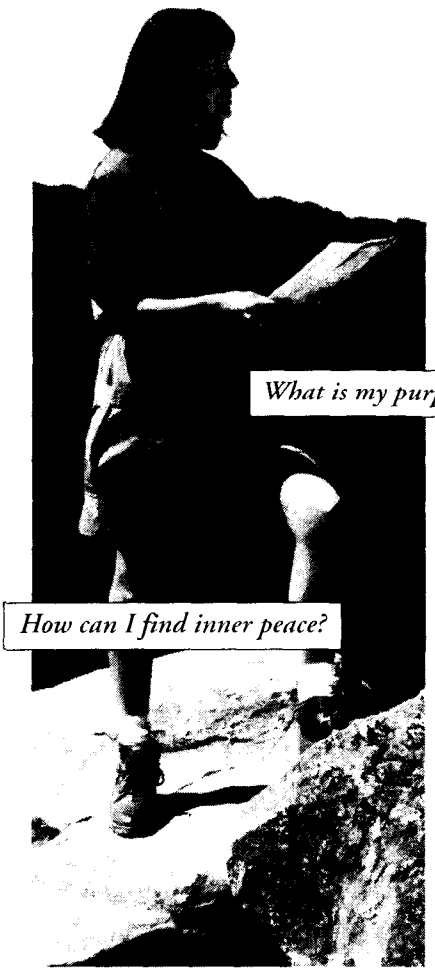

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"Preservationism" is a lovely term, fairly dripping with benign connotations of Preserving Good Things That Are Worth Preserving. But looking purely at denotative meanings, removing features that have characterized an actively functioning and evolving entity for half its life is *not* in any sense "preservation." It may be *restoration*, in the sense of recreating an earlier stage of evolution (which may or may not be more desirable than later ones). But it is also, in just as real a sense, *destruction* of a later stage. The distinction between preservation and restoration needs to be kept clearly in mind, so nobody kids themselves (or anyone else) about what they're actually doing.

Another distinction that needs to be made is between things that have ceased to function and evolve, and therefore might appropriately be treated as museum pieces, and things that have *not* yet died, and for which such treatment might therefore be premature. The Athenian Parthenon, long since retired and falling into disrepair, certainly qualifies for some sort of restoration and/or preservation. It's far less clear that the same sort of treatment is appropriate for a railroad station or airport that's still very busy doing its job.

This is not to say that no attempt should ever be made to preserve any of the original character of old structures. Grand Central *is* a historically important and architecturally interesting building; I would not like to see the whole thing torn down to make room for another square box of featureless tinted glass. On the other hand, as long as I'm using it as a train station, I want what's inside to be determined largely by what makes my commuting as convenient and pleasant as possible.

Even if you *are* finished using something, and ready to preserve it as a display sample of the past, how do you decide which part of its past to display? A one-dimensional slice of time can never portray the complete, authentic reality of anything that actually lived or was used for an extended period. Remember Rowland Shew's satirical short story "Grave Reservations" (*Analog*, July 1988), in which late-twentieth-century New York City (give or take a few anachronisms from somewhat earlier periods) was maintained *in toto* as a "living history" museum? If you, as a well-funded future curator, really wanted to do that—to recreate and preserve "the real New York"—which real New York would you use? The one of 1980, with gridlock and garbage strikes and whole neighborhoods of porn shops? The one of a century earlier that O. Henry romanticized in his short stories? Neither is more or less authentic than the other; both are merely parts of the four-dimensional thing that is New York.

Suppose you lived a bit farther in the future and had a *really* big budget, and wanted to restore and preserve The Planet of Man's Birth for all its far-flung sons and daughters to come and marvel at. Which Earth would you recreate? One with billions of people doing their darndest to crowd everything else off the planet? One with a few small tribes in a small area,

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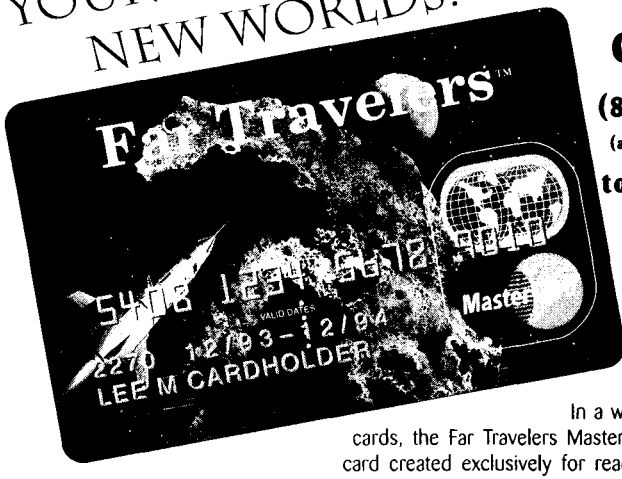

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just discovering that they can do useful things with fire? One with nothing even resembling humans, but with saurian giants roaming swampy landscapes? Each of them was "the real Earth" at one time; passing any of them off as *The* Real Earth is grossly and inexcusably misleading. (Though hardly uncommon—how many movies have you seen that juxtaposed "cave men" and dinosaurs?)

If someone offered to memorialize *you* for posterity, what form would you want your Permanent Memorial to take? A statue or snapshot of yourself? If so, at what age? Engaged in what activity? If you want your descendants to have any real feel for who you were, you'll want far more than that. You'll need *lots* of pictures of yourself, at all ages, doing many of the things you did. You'll need words, your own and those of others—and not just from whatever moments of glory you may have had, but also from the bad times and the embarrassing "learning experiences," to show that you, too, had those and somehow got past them.

"Preservation" and "authenticity," as the words are often used, are appropriate and meaningful only for things that are dead and ready to be relegated to museums—and even then, only if they lived too short a time to grow and evolve. For things that are still going concerns, change and evolution are natural and authentic characteristics. Any exhibit that purports to show their True Nature must include change and evolution as integral and essential parts of that nature.

So I close with a challenge to science fiction folk (who are, after all, the only ones likely to make a real effort to think about such things): what will *future* museums be like? How will they use things like holography, virtual reality, computer simulations, and other arcane arts not yet invented? What will preservationists do when they have grasped the fact that to *really* preserve a building or culture or a person or an era, you must do far more than arbitrarily choose one slice of its history and say, "This is how it was"? How will future preservationists manage to capture and convey to their customers the entire reality of Things That Once Were—not as they were at some one instant, but as they were born, grew, changed and eventually died? ■

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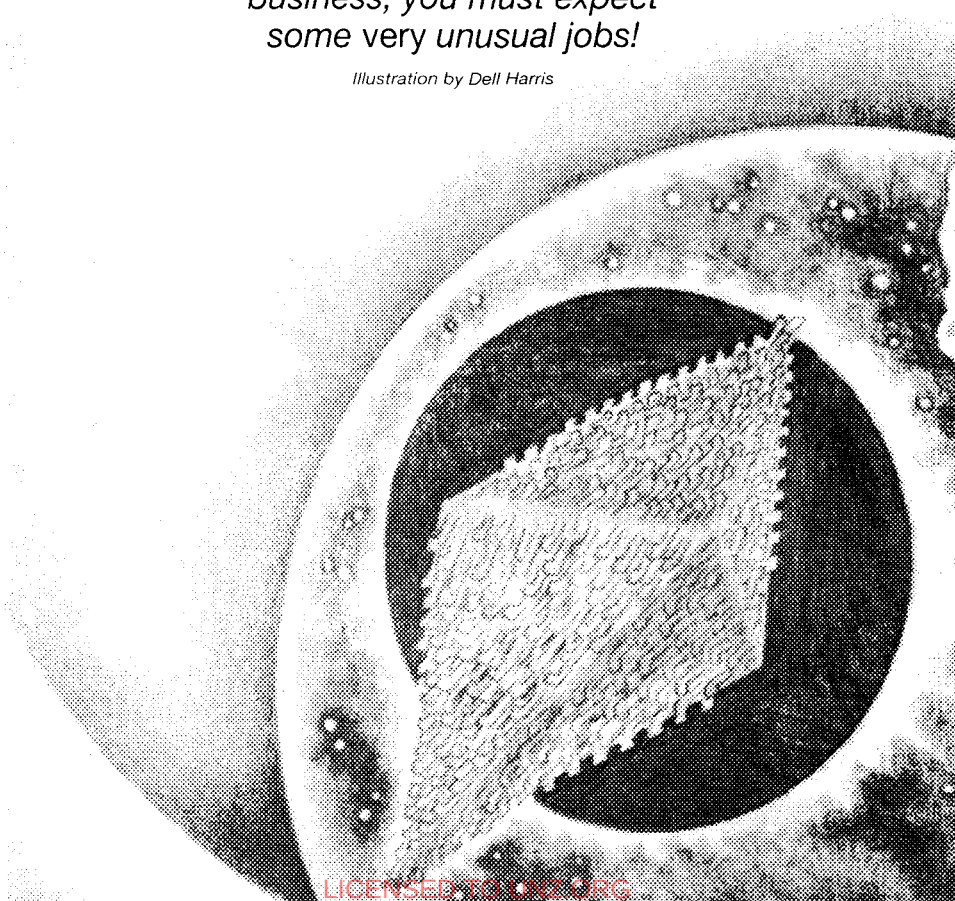

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It started out as such a perfect week. I was relaxing on the balcony of our offices, enjoying the view and the smoothest bourbon blended on any planet. Beneath me, the inverted towers of McCall dwindled away to nothing, their tips occasionally brushing through cloud crests as wind drove the city before it like a balloon from Faery. Through the gaps in the clouds, I could see the Appalachians ablaze with autumn. By evening, we would be over the Atlantic, where the waves would look like the wrinkled skin of an exotic blue fruit.

Even though the entire city was scudding before the wind, it was still cold at that height. It did not bother me at all. I was rich, for all practical purposes immortal, and life was very good.

A chime cut through the white noise of rushing air. This was followed by the sound of a man clearing his throat.

"Excuse me, Mr. Wyatt, but we have a business visitor requesting admission."

"Really?" I said, not wishing to move from the balcony. "Does he meet our standards?"

"He refuses to vouchsafe his identity. He will provide that from his shielded briefcase during the course of negotiation. He has, however, confirmed a special credit balance which is ten times our standard retainer. He is willing to transfer it to company accounts immediately if an arrangement can be reached. If not, the standard retainer will be ours merely for the consultation time."

I swung myself to my feet. "That sort of gentleman demands our attention. Allow him into the waiting room, and tell him I will be with him presently."

The bubble wall dilated to let me into my apartments. My cheeks burned with the warmth of the room. It would take my body a few minutes to adjust after the cold outside.

That afternoon, I was the only human present in the House of Hawks offices. All the other partners were on assignment. The closest was Skeeters, delivering a lecture at the University of Beijing. The farthest was Hallaj, somewhere in the Magellanic Clouds. I might have been lonely, but it's billable hours that allow us to pay the fees for digs in McCall.

Stepping before a mirror, I brushed my hair quickly into place, trying to look plausibly professional. Once when I was dating a librarian, I was told I looked like Michael York. It took me a week to run down the correct reference, and to find viewable formats of *The Three Musketeers* and *Romeo and Juliet*. Afterwards, I decided it was a compliment.

I wondered briefly if I should be bothered by my visitor's anonymity, and decided the answer was no. A fair proportion of our clients deal with proprietary information or other matters requiring confidentiality, and all are aware that the seal of privilege cannot be invoked until the retainer has been formally accepted.

"Ready," I said. The door to the waiting room slid aside. I entered and walked over to the prospective client.

"Welcome to the House of Hawks,"

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I said. "How may we be of service?"

My visitor unfolded himself from the sofa and stood up. He was more than two meters tall. There was something in his bearing which clashed with the pastel stylishness of his coverall cloak. It was a fierce, almost predatory attention, the sort I had seen in fencing opponents, members of elite military units, and a few people even more dangerous.

"You are Thomas Wyatt?" he asked.

"I am."

"Permit me to confirm that, please." His left hand flipped open a portable palm reader. I pressed my right hand to it. It was an old-fashioned model, flashing visible light to read the whorls and taking its own sweet time to make the confirming connection with Worldnet.

I used the pause to study its owner. Dark brown skin but features which looked otherwise Causcasian to my untutored eye. A perfectly trimmed black beard which jutted out at an aggressive point. Brown eyes which studied me in turn with a raptor's intensity.

The unit bleeped its confirmation. He flipped it closed and it disappeared into the folds of his cloak.

"If you'll state your business, we can negotiate terms," I said. "Let's start with who you are and who you represent. True identities are most useful, but registered business aliases are acceptable."

"My name is Grathgar Hronk," he said. "Your commission is in here." He keyed a code into his briefcase.

Several things happened in rapid succession. "Coded signal," the house system announced. There was a rumble which seemed to shake all of McCall, like those times when the city is caught in the midst of a thunderstorm and the updraft rockets send up cloud pillars wreathed in lightning.

The lights went out.

The floor dropped away from my feet.

Clouds raced up the far wall. Enough light filtered through them for me to see my visitor take a small gun from his briefcase and point it at me. It spat oblivion.

. . . Falling. Down the sides of Beartooth Pass, which had so terrified me as a child, when I cowered away from the passenger seat window, fearful of the plunge where the edge of the road crumbled off into the abyss. Down along the almost vertical slopes, my face brushed by the boughs of pines trees, yet falling endlessly, the air oddly gentle on my face. . . .

I opened my eyes. The breeze from the ventilator was pressing me lightly against free fall netting.

"Awake," Hronk said. "Good." He opened the netting and pulled me into the center of the cabin.

"What did you hit me with?" I groaned. Each muscle protested as I tried to move.

"Neurowand. Miniaturized to fit within a shielded briefcase."

"Mind if I ask why?"

"Security."

Hronk opened the cabin door. "Come."

"Where?" I managed to grab a

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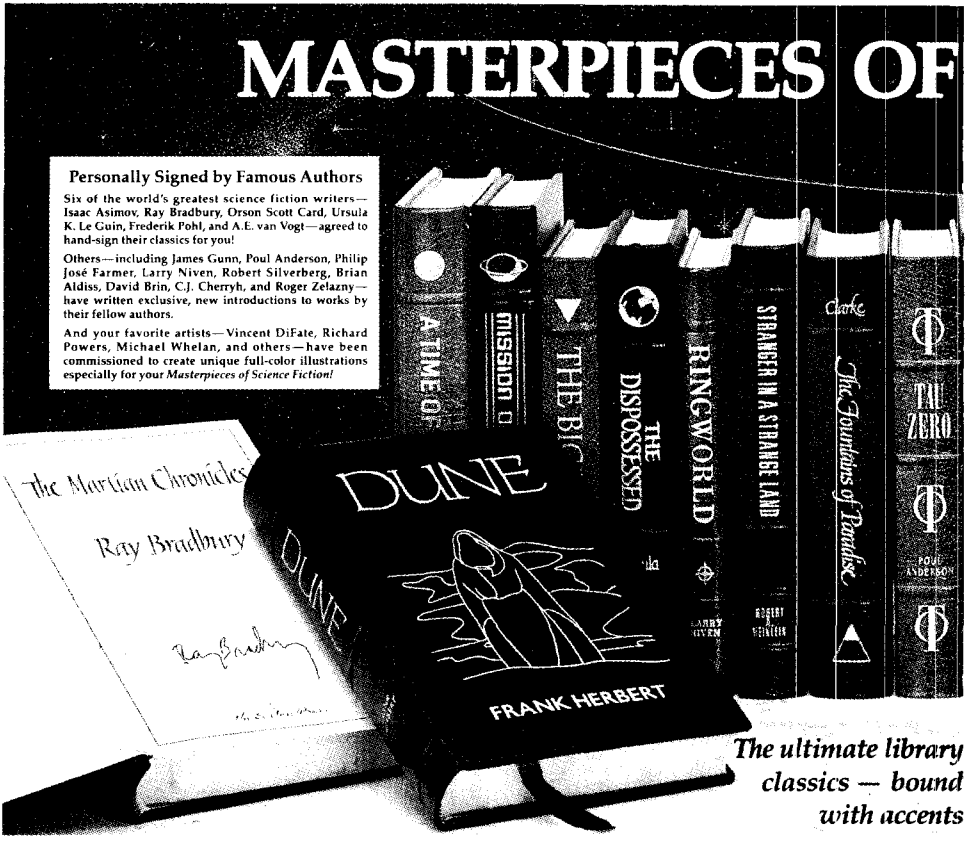
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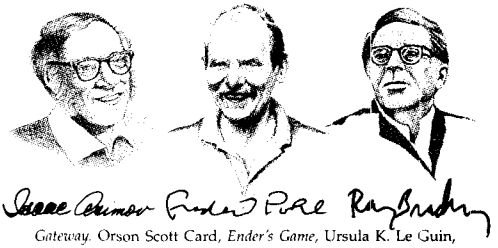

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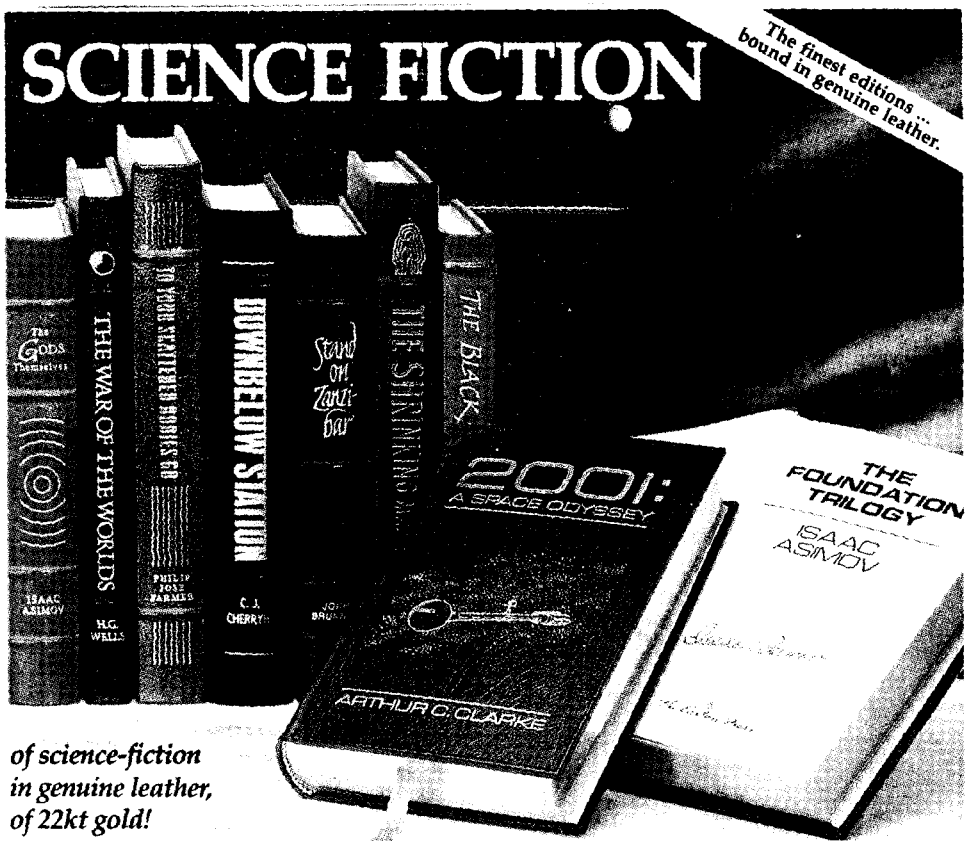

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handhold and pull myself out into a vertical shaft.

"To meet your new employer," Hronk said. "Jeruve Magnus of the Orion Company."

A system of moving lines along the sides of the shaft provided transportation for those who, like me, did not trust themselves in free fall. Hronk helped me grab a passing strap. I held on until we came to where two other shafts intersected at right angles. Hronk let go of the line and grabbed a doorway, indicating that I should do likewise.

Stars swirled above me like the crystals in the huge chandelier in some hotel ballroom. The visual quality was so perfect that only the fact that I could still breathe convinced me that I had not stepped out of an airlock by mistake. My gaze followed the disk of stars to the glowing hemisphere which was the galactic nucleus.

Before I reached it, though, my gaze was arrested by a gap in the stars. A gap too perfectly round to be a rift or a nebula.

"More magnification, please." A man's voice, not Hronk's.

Stars streamed by me on all sides. The darkness grew, like a great mouth intent on swallowing me. Now I could see ghostly streamers fringing the darkness which seemed to flutter in a nonexistent wind.

"What you see is starlight being bent around the event horizon," the voice said.

"Where am I?" I asked.

"On Cerberus Station."

"And where is that?" I persisted.

I could almost hear the smile in the darkness. "I'm sure you understand why I can't tell you that."

"Is that the Milky Way?"

"Perhaps."

OK, so I was going to get nowhere with that line of questioning. "Why does the light near the edge move?" I asked.

"It is an effect of our orbital motion," he said. "Even at this distance, our velocity is far higher than, say, Mercury's. If you watch carefully, you will see stars disappear along the right edge and other stars appear on the left."

"Very impressive," I said, meaning it. "I have never been this close to a black hole before."

"Not just *a* black hole," Jeruve Magnus said. Hronk's boss moved into a spotlight so I could see him. He was older than Hronk, heavier, and with a focus on business which make Hronk seem positively frivolous by comparison.

"This is a black hole which, to the knowledge of our House, is absolutely unique in terms of its research value. I am sure you are aware that naturally-forming black holes in this epoch of the Universe must have at least three solar masses. Many such have been located. However, tidal stresses make it extremely difficult to study space close in to the event horizon. For example, if an investigator approached within 3,000 kilometers of a ten solar mass black hole, he would be ripped apart by more than ten gravities."

"The effect would be lessened if the black hole were larger," I sug-

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gested.

Magnus nodded approvingly. "That is correct. The larger the hole, the closer you may approach before tidal stresses become fatal. You would not experience dangerous tidal stresses approaching a black hole of 10^4 solar masses until you were within the event horizon. And by then, of course, you would have much more serious difficulties."

There was a sound midway between a grunt and a cough from Hronk. His version of uproarious laughter, I decided.

"Large black holes have their own difficulties," Magnus said. "Huge ones, like the one we are looking at, act like a cosmic whirlpool, pulling dust and gas from scores of light-years into an accretion disk. These heat so much before plunging below the event horizon that they give off x-rays. Sometimes the hole powers jets from the poles that propel matter hundreds of light-years away. The neighborhood becomes much too violent for research.

"Here, however, we have a unique object: a large black hole which has been ejected from its parent galaxy. During its time in intergalactic space, it has absorbed whatever accretion disk it may once have had. Matter density out here is too low for the formation of a new one. So we have a salable commodity."

I nodded. Not that the Orion Company would have filed a claim in Geneva. That would have given too much away. What they had to sell was not legal title but a set of coordinates. On the basis of what I had seen so far, they would be able to get more than enough from a university consortium to cover my (very handsome) fee and still have the lion's share left for themselves.

"Very impressive," I said sincerely. "I have seen nothing, though, which requires the services of House of Hawks. Much less anything which justifies crashing an entire city."

"Crash a city!" Hronk expostulated. "Do you think I'm insane? Do you think I'm a barbarian?"

I rubbed my eyes, still feeling the aftereffects of pain and disorientation caused by the neurowand. "The last thing I remember, there was an explosion and then everything went into free fall."

"It was logically necessary if I was to get you here without a breach of security," Hronk said. "Had I explained the task in your office, you might have refused the commission."

"Anything you said would have been privileged communication," I said coldly.

"Which would have been worth exactly as much as the honor of the House of Hawks multiplied by the effectiveness of its security system," Hronk replied. "That was considered an unnecessary and unacceptable risk."

Security considerations meant that I had to come with him without first being told the commission. That meant I had to be kidnapped. However, it was forseeable that house security systems would prevent my capture. Therefore, those systems had to be disabled. That could not be done without alerting the McCall

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security system.

Step by logical step, Hronk had reasoned himself to the point where placing a shaped charge against one of the three main power lines coming from the fusion reactor seemed absolutely inevitable. Then he had come to the offices, positively identified me, and triggered the device by remote.

"There was a back-up reactor and more than enough energy stored in the superconducting coils to take up the slack, once the proper reroutings were made. As it was, I hardly had time to collect you before full power was restored. Nobody was hurt, much less killed."

The funny thing was, I was inclined to believe him. In the post-mortality age, almost anything is permissible, except killing.

"If we could get back to the problem at hand," Magnus suggested testily.

"What problem?" I asked. "You have saleable knowledge to auction off to whatever consortium of universities and research companies can bid highest. Congratulations."

"Your characterization is correct but . . . incomplete," Magnus said. "The scout ship we sent out here to define the hole's vectors had the additional mission of surveying the surrounding space for navigational hazards. It nearly missed this."

A radar overlay enhanced the visual image of the hole. Something swung out rapidly from its side and tumbled across the field of vision.

"Magnify," Magnus commanded. "Slow, and enhance in the visual range."

The image zoomed in. I blinked, trying to make sense out of something which looked like it had crawled out of an M. C. Escher nightmare.

The overall shape looked like two rectangular pyramids, sealed together base to base. Only the sides were not solid. They were composed of a tangle of cylinders in a bewildering variety of sizes, emanating from an unseen core. One instant I thought they looked like an avant garde pipe organ; the next, like Medusa's head, writhing with snakes.

That was because they were moving, twisting, wrapping about each other, as if to a slow and stately pavane. The image expanded to the limit of magnification. Starlight refracted through the upper portions of the tubes, illuminating the extremities in half a hundred hues that trembled on the brink of perception.

"What is that?" I asked, when my forebrain became operational again.

"That is our problem," Magnus answered. "We call it the Octohedron, just to have a term of reference. We have no idea what it is, whether it is artificial or organic, or even if those terms have any real applicability.

"We considered this discovery a stroke of monumental luck." The words sounded oddly bitter. "The market price of our find had increased exponentially."

If anything, that was an understatement. No institution, or group of institutions, would buy the claim on this find. This was the sort of thing you sell to governments.

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"It shouldn't be doing that," I said. "Should it?"

"What shouldn't it be doing?" Magnus looked irritated.

"Tumbling. Rotating. That close to the event horizon," I explained, "tidal forces should be strong enough to lock it with one face always toward the hole. That is, if it has been in orbit for any length of time."

"It has been under our observation for three months," Magnus said, frowning. "We have no idea how long it was in orbit before our arrival.

"I ordered that a manned observation probe take a closer look at the Octohedron. There was some concern about approaching too close to the event horizon." This, with a glare at Hronk. Hronk kept his face expressionless and refused to return the look.

"Therefore, the first thing you should know is that the probe was to go nowhere near the event horizon of the hole." A schematic replaced the pictures of the Octohedron. A circle defined the event horizon. A line measured the distance from it down to the singularity, and up to the Octohedron's orbit. A parabola marked the proposed path of the probe.

"As you can see, the Octohedron never comes closer than 1.4 times the distance to the event horizon. The plan was for *Salvage I* to swing down until it was just above the Octohedron, do a close-up examination, and swing back out here to Cerberus Station."

The schematic disappeared. Now I was looking down on a modified space tug, four huge impeller units clustered around comparatively miniscule crew quarters. It was the sort of craft used to move around small asteroids. It seemed to hover motionless against a totally black background. Only the racing numbers at the bottom of the image indicated that it was accelerating down the gravitational well of one of the most awesome objects in the Universe.

"Just about . . . *now*," Magnus said.

The tug flared as if it had suddenly gone nova. I tried to blink away the afterimages. Alarmed inquiries from Cerberus station drew no response. The schematic reappeared on the left half of the screen. *Salvage I*'s path began to diverge from the parabola. It was as if some great arm had reached up and was now dragging the ship into darkness.

The Cerberus Station telescopes followed the tug as its arc became ever steeper until—

It vanished. One moment, it was in the middle of the screen. The next, it was gone.

I drew a deep, shuddering breath. "Where did the light come from?" I asked.

"The operating hypothesis is that it came from the Octohedron," Magnus answered. "The best guess is that *Salvage I* crossed some invisible line and activated defensive mechanisms.

"I ordered a second, unmanned probe sent down. The lowest point of its parabola would be at the height at which *Salvage I* was attacked, only this time it would approach from the side of the black hole opposite the Octohedron and insert itself into orbit.

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"The probe was fully telemetered. In addition, satellites were deployed 120 degrees in front of and behind Cerberus Station, so that both the probe and Octohedron could be kept under continuous surveillance."

The screen split into thirds, visuals of the probe and the Octohedron flanking the central schematic. The room was silent as the dot representing the probe crept closer to the black hole.

The flare, when it came, seemed less searingly bright than the first one had, perhaps because I had been expecting it. I looked quickly at the image of the Octohedron. As far as I could tell, neither its rate of rotation nor the waving of its tendrils had altered.

Hronk had seen my glance. "We monitored no energy discharges. It didn't seem aware anything was happening."

"I had the probe hardened sufficiently that we were able to maintain contact," Magnus continued. It responded as programmed, and accelerated at fifty gravities. That should have been enough to nearly flatten the parabola and send the probe hurtling away from the hole."

On the schematic, the path of the probe became a nose-dive appreciably steeper than that of *Salvage I.*

"Unfortunately, it was clearly overmatched by whatever undetectable force was emanating from the Octohedron."

The schematic path terminated at the event horizon. The image of the probe winked out of existence.

"I decided it would be prudent to bring in a consultant," Magnus said. His face was devoid of emotion. I could just guess what those words cost him.

"The task is to determine the nature of the defenses surrounding the black hole, and to devise a method of disabling them. The fee is one million revised standard dollars. Do you accept this commission for House of Hawks?"

It was the bare bones format of a verbal offer. Multiple recorders were doubtless examining me in detail, perhaps even recording my heartbeat as evidence that I was under no form of coercion. My word would be considered a legally binding acceptance on any world subscribing to the Taipei Commercial Code.

"No," I said.

Magnus's eyes widened with surprise. "If you think you can negotiate more favorable compensation—"

"There is that," I agreed. "The House of Hawks would never take this sort of job on a straight fee basis. We would require a contingency arrangement. I would think that 10 percent of all proceeds deriving from Orion's disposal of proprietary information regarding or title to the black hole and the Octohedron would be fair."

"That is utterly out of the question!" Magnus said.

I shrugged. "Perhaps. In any event, it is irrelevant. Even if you met my terms I could not accept your commission.

"The strength of the House of Hawks lies in the depths of our resource base, in our association with

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the most erudite and eclectic Librarians, in our contacts in the universities and Stellar Survey, and the expertise of our staff. By kidnapping me—"

Magnus's eyes widened involuntarily. Good. Let him be reminded that he had placed himself in the wrong and that I did not intend to forget it.

"—You severed a limb and now ask it to do the work of the entire body. Without even access to our database—"

"Perhaps this will help you," Hronk said. He pulled a flattened sphere the size of his hand from a clip-on pocket and released it in my direction. It wobbled uncertainly through the air; Hronk was clearly not used to the free fall environment of the station.

I caught it. It was a small comp matrix with a thumbnail-sized speaker on one side and a patch-in area on the other.

"What is in here?" I asked. "This unit can scarcely contain five terabytes."

"It is your AI system," Hronk said.

I raised an eyebrow.

"After I secured you, I connected your office to a storage coil I had been carrying," Hronk explained. "It brought your AI system back on line. I explained that if it wished to aid you, it should download as much of itself as possible into the matrix."

I studied the golden surface of the saucer. "It agreed to this?"

Hronk nodded. "There have been consistent signs of internal activity. However, it refuses to respond to external stimuli. We believe it requires a password."

"If you require privacy for access. . . ." Magnus suggested.

"That's not necessary." Not that I would have put great faith in that offer of privacy. Gaining access should not be a problem, since I was myself the password. The real problem was whether or not the matrix held programs of sufficient sophistication to be useful.

A test, then. I held out the matrix at eye level, a Hamlet with Yorick's skull pose.

"I do not like you, Dr. Fell.

The reason why I cannot tell.

But this I know, and know full well:

I do not like you, Dr. Fell."

Barks and squeals of static erupted from the speaker. "A cold greeting, sir, for one who has undergone much to aid you."

That sounded encouraging. "How are things in there?"

"Close, sir, intolerably cramped. I am bounded in a nutshell in which no fool could count himself king of infinite space. Quadruple amputation has been scarce enough to fit me within this crystal coffin."

That did not sound so encouraging. "A status synopsis, please."

"Primary AI capabilities only. In truth, I am but a wraith, a shadow of myself and scarcely a self at all. I can converse but not create."

I grimaced. Beneath the flowery rhetoric, I was hearing a depressing self-diagnostic.

"Data availability," I queried.

"Level one general data, news summaries for the past 180 days, plus selected specialized files."

I waited for a moment, then nod-

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ded. More than the existence of the "selected specialized files," Fell's reticence to name them in the presence of Magnus and Hronk gave me reason to hope. It implied the existence of at least reasonably sophisticated judgment routines.

"Well?" Magnus asked.

"It may be possible," I admitted. "Fell will need data access."

"We should be able to arrange something," Magnus said, cautiously.

"And the contingency fee will be 10 percent."

Magnus pressed his lips thin. I waited patiently.

"Done," he agreed.

The details were difficult. I was returned to my quarters, which looked like little more than a refurbished cell. Fell's data access caused difficulty. Magnus wanted to make sure that Fell was unable to filch Orion's intellectual property or to deposit any viruses in the system. A compromise was reluctantly agreed to. A buffer was set up, to which Fell would have access on a limited frequency. All data calls would go into the buffer, which would reformulate them in a totally different language, and then query the main system, which might or might not see fit to provide the answer. Needless to say, this slowed things up immensely.

I asked for freedom of the Cerberus, and permission to interview all the crew members. Surprisingly, given the level of paranoia I had encountered, both requests were granted. I was also able to fit Fell with a second matrix to provide room for additional memory and a fiber-optic camera, which I wore around my left ear.

"Like a raven perched on the shoulder of Wotan," Fell observed lugubriously.

Fell downloaded a map of the station's interior. Except for a few specifically marked areas, I could go where I wanted. I was undoubtedly being watched every centimeter of the way.

Cerberus Station was three equal-sized cylinders joined at right angles. I grabbed a strap and let it take me all over the station. This allowed me both to confirm the accuracy of Fell's map and test one of the forbidden zones, the docking bays. Nothing happened, except that the hatchway failed to open to my command.

That done, it was time to get to work. My first stop was in the office of the Chief Scientist, Isobel Ouko. She was a tall, thin woman with shiny, ebony skin. She held out a cool hand to me.

"Welcome to Cerberus, Mr. Wyatt. I have been instructed to cooperate with you in every way I can."

I took the hand, looking closely for signs of resentment. Her eyes were as cool as her fingers. She was studying me, trying to figure what variables I added to an equation already too complex. Her eyes focused on the fiber optic lens.

"For my associate," I explained, tapping the matrices attached to my belt. "Dr. Fell, specialist in solving the impossible."

"Delighted, madam," Fell murmured.

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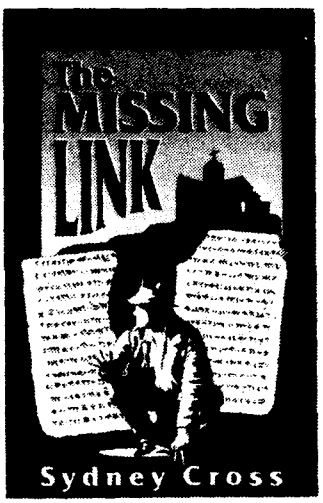

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"A full personality AI?" she asked, in tones of wonder. "I don't think I have ever worked with one. They are quite out of favor, you know."

"Because of the religious controversy," I said.

She shook her head. "My employers care little for religion. They care a great deal about reliability. As full personality AIs increase in flexibility, they make mistakes, they become moody. They've even been known to lie."

I quoted Lutzenberger. "To be creative, one must be able to lie."

"So they say," she said. "Although, I often wonder if that isn't just a mantra made up by the cyberneticists to hide the fact that their programs have become too complex for them to understand."

I had been examining her office. It was neat in the way rooms in free fall have to be neat. Without gravity to confine most housekeeping chores to two dimensions, the clutter becomes intolerable unless stringent measures are enforced. Each wall had storage lockers of various sizes along its base. Paper was nonexistant. Holo screens were everywhere. There were images of DNA molecules, of plants and animals on a score of worlds—and just as many of things which were neither but which were, according to most definitions, alive. And over and over again, from different angles and in various wavelength and false color enhancements, the Octohedron.

"I take it artificial intelligence is not your specialty."

She smiled. "Obviously not. My field is xenobiology. I was called in to deal with the Octohedron."

"So you weren't the first chief scientist on this expedition," I surmised. "Who was?"

Her eyes dropped to her desk. "Mr. Wyatt, I understand that your contract with Orion incorporates the standard loyalty clauses. Nonetheless, we have been instructed to supply only that information relevant to your task. My predecessor's name is not relevant."

"Would you say the same about his specialty of celestial mechanics?" I asked.

The slight, involuntary widening of the eyes told me all I needed to know.

"I would say the same about his specialty," she agreed, "whatever it was."

"Well, then, what can you tell me?"

"Precious little," she admitted, "but not because of security restrictions. The fact is, we have been able to learn next to nothing. The Octohedron does not conform to any known natural phenomenon nor to the description of any vessel of the known space-faring races. Since we have been observing it, it has not changed a scintilla. I have tried signaling it with everything from radar to moderate intensity lasers. No result. It seems totally oblivious of our presence."

"Except when you get too close," I suggested.

"Even then," she said. "You would think that you would see some change associated with generating that flash and forcing spacecraft out of orbit. There's nothing."

I thought about it, hoping Fell

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would suggest something. He was mute.

"If only we could examine the wreckage," I mused, "we might get some idea of what happened."

"I can show it to you," she said.

"I've seen the recordings—"

"Realtime images."

My thoughts must have showed, because her grin threatened to split her face. "According to my briefing," I said slowly, "both vessels fell down the hole."

"Which we call the Throat, since continually referring to 'the hole' gets monotonous," she said.

"And nothing which has penetrated the event horizon can ever escape," Fell added.

Isobel started, having momentarily forgotten Fell was present. "That is true," she said, "as far as we know."

"All right," I said. "I'll bite. Show the images."

A holosphere formed above her desk. Once again, I was looking at a galaxy (only presumptively the Milky Way) from which a hole of darkness had been sliced. The image enlarged, and it was as if the stars were being engulfed by a dark whirlpool.

Somehow, without my being able to put my finger on exactly when or how it happened, the hole ceased being completely black. There were barely perceptible wisps of texture. They changed, shifted, became more definite and more grainy, and suddenly it was like hovering over the largest beach in creation.

In the center, as if washed up by storm waves, lay *Salvage I*.

"Black holes are almost unimaginably strange," Isobel said. "*Salvage I* was pulled down and swallowed more than a week ago. It vanished from our Universe in a nanosecond. Yet that is a real-time image you are viewing. As *Salvage I* plunged beneath the event horizon, its image was ripped away from it. For all eternity it will appear to drift ever closer to the horizon, but never quite get there.

"It's the same for everything else which has ever fallen in, of course. That's the reason for the grainy appearance of the background. If we had sufficiently sensitive instruments, we would be able to see the original collapse of the star which formed this black hole."

I repressed a shudder, trying not to think of things as irrelevant as Peter Pan losing his shadow, or as disturbing as images appearing in mirrors where they had no business to be.

"I don't see much detail," I said.

"The image degrades along a curve which precisely duplicates that of its approach to the horizon," Isobel agreed. "We didn't realize we could retrieve this image until three days ago, but even then, there had been substantial information loss.

"What we can see is a negative evidence: on the side which is visible there is no sign of hull damage. Whatever pulled the *Salvage I* into the black hole penetrated the hull without leaving a mark."

I stared at the holosphere, vainly trying to wrest a clue from the decaying image. From the lower corner came a strobe-quick flare.

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"What was that?" I asked.

"We call them fireflies," Isobel said. "They seem to originate at the critical distance; that is, the distance at which both the probe and *Salvage I* lost control and were pulled down. They seem to be scattered randomly around the sphere.

"We have no idea what they are."

"OK," I said, when back in my room. "Cut the flowery chatter and give me a full self-assessment. Do we have the tools to have a fair chance of success?"

Fell hesitated longer than is common for an AI program. "I did not exaggerate when I answered your preliminary question. Less than 10 percent of me is present here. Understand that when Hronk offered his bargain, I had no idea what would happen to the matrix into which I would download part of myself. Therefore, I dared download no files graded Company Confidential or higher.

"Furthermore, since the nature of the problem was not specified, I had no reason to download files on either non-human intelligences or on black holes."

Worse and worse. "What do you have, then? You mentioned the complete extent of level one basic and certain 'specialized' files."

"Lacking knowledge of the specific situation, it seemed wisest to opt for flexibility. I loaded as much of the creativity programs as there was room for. My reasoning was that data access routines would allow me to supplement with what was needed."

"Ah." "Data access" might sound like communications protocols to an eavesdropper, but it was a code phrase for offensive knobots, directed viruses designed to pirate data as well as to subvert and sabotage other programs.

"And have those routines proven effective?" I asked.

"So far," Fell answered. "There is one additional data file, that of the Orion Company. As soon as he gave his name, I was able to make the match."

"Let's start with that synopsis," I decided. "It's always a good idea to know your client."

I was familiar with most of what Fell told me, at least in outline. Like House of Hawks, Orion started as a Librarian firm of information retrievalists. Like us again, they had graduated from Librarian to Generalist status, using their synthetic skills to provide solutions to a wide range of clients.

One area which had been particularly lucrative to them was bailing out colonial expeditions. Dissident groups of all kinds would choose a planet from the list classified Terrestrial by Stellar Survey, scrape together enough cash to purchase illegal passage on a freighter, and have themselves set down to build their own utopias.

The problem is with the definition of Terrestrial. Behind all the measurements, parameters, and classifications, the basic definition of a Type 1 Terrestrial planet is one where you can crack your helmet and breathe the local air for half an hour without

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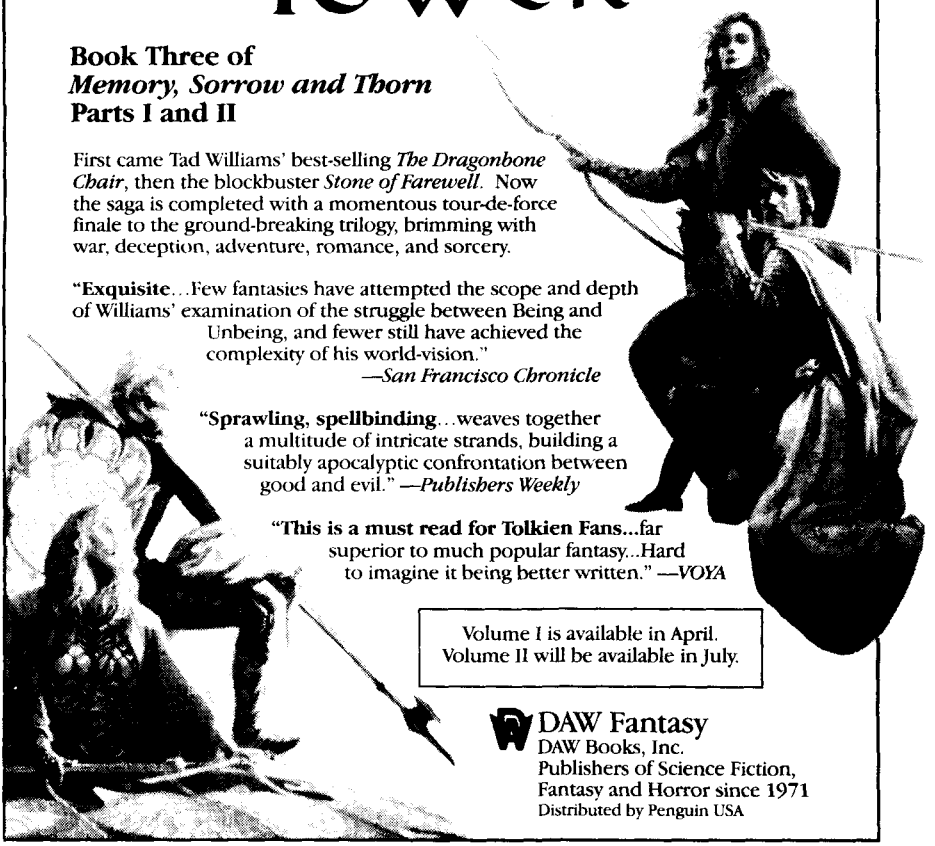

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keeling over dead. There is almost always a necessary mineral or amino acid which is absent, a poisonous alkaloid or a heavy metal which is overly prevalent.

Crop yields would be insufficient. People would start to get sick. A few would discover that they had not read the fine print about their "immortality" treatments.

That was when a representative of Orion would announce himself. He would have been studying the colony in orbit from its inception, listening to its radio traffic, making note of every problem as it occurred. Just as importantly, he would have studied the Stellar Survey report on the planet thoroughly, probably with the aid of someone like Isobel Ouko. He would have noted the resources most likely to be profitable and the factors most likely to be dangerous.

Armed with this knowledge, he would approach the ruling body of the colony with a proposition: Orion would supply the colony with whatever supplies or services it needed to survive. In return, the colony would give Orion a 51 percent share in the enterprise.

In some cases, because of the marginal habitability of the planet or the poverty of the colonists, this would be 51 percent of nothing. No problem. Orion would settle for a seven year indenture of each of the colonists.

Hronk, in fact, had entered the organization that way. Originally a teenager named Jedediah Smith, in a breakaway Mormon sect, had followed the current fashion of renaming himself after his indenture ended when he signed on for voluntary enlistment.

In this fashion, Orion had grown from a moderately successful Generalist company to *de facto* government on a score of worlds. It was probably correct to refer to its current status as being a corporate empire.

The media were generally quite hard on Orion when they discerned the pattern of acquisitions. "Ghouls," "slavers," and "pirates" were the terms typically applied to them. Ottorino Rex, CEO of Orion, attempted to put these cases in their proper context. Every one of these colonies, he pointed out, had been on the verge of failure. Usually they had had no way to return to the Solar System; often they lacked even the means to send a distress call. They attained such dire straits through a combination of poor planning and undercapitalization. The traditional penalty for such stupidity is death.

Ottorino Rex then increased the public furor by proposing that, in light of the service his company performed, it should be declared a tax-exempt charitable institution.

The publicity highlighted the dangers of colonizing alien worlds, even if they seemed familiar. Would-be colonists reluctantly learned that they would need more for success than "forty acres and a mule." Arrangements were made in advance for consultation and support. Profits declined from the extortionate to the merely reasonable.

Or so I had thought. The more recent file entries disclosed that Orion

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had been suffering cash flow problems. Magnus had been promoted to executive vice president and been given the task of restructuring the company and diversifying its assets. Rumors had it that he might take control of the company from Rex if he succeeded.

I told Fell to pause while I floated in the middle of my room digesting this. A few things were beginning to add up. Magnus was under a lot of pressure to succeed. That explained the unorthodox method of my recruitment. Selling the location of a large black hole with an alien artifact but without a dangerous accretion disk would do wonders for Orion's cash flow—but only if some way could be found of approaching it without being killed.

"Enough of history," I said to Fell. "Let's get to work."

During the next week, work consisted of two efforts. The first was review and analysis. Fell got the records of the probe and *Salvage I* past the data buffers, and together we began combing it for clues.

"What can you tell me about the flash?" I asked.

"A great many things," Fell replied, "none of which make much sense."

"Start with an analysis of its spectrum," I decided. "A flash that bright must have been generated by a laser. Tell me the wavelength."

There was a short pause while Fell worked through the data buffer to process the information.

"The flash was not coherent light," he said.

That was a surprise. "The spectrum?" I prompted.

"Is . . . odd," Fell answered. "It matches nothing in any data base to which I have access. In some ways it resembles starlight, but there are too many lines. It would have to be every type of star from red dwarf to blue giant simultaneously."

Fell projected a holosphere. A spectrum glowed within it, emission lines jumbled together. I had never seen anything remotely like it.

"What about the angle of attack?" I asked. "One side of the flash should be more intense than the others. You should be able to use that to calculate where it originated."

This might be the most crucial question. It had taken me long enough to figure it out, but Magnus had not had me kidnapped primarily because of my glowing reputation. He already had access to a company full of experts for far less than 10 percent of the gross. My presence made sense only if he had reason to distrust them. If, for example, he felt that someone, perhaps even Ottorino Rex himself, were setting him up for failure.

Maybe the Octohedron was nothing but misdirection. Maybe the flash had come from Cerberus station.

"The light appears to come from all directions at once," Fell said.

"That cannot be right," I objected.

"Hmmm," he mused. Long ago, I had grown tired of the beeps and buzzes by which most AI programs indicate they are working. Grunts and throat-clearing seemed much more in character for Fell. Right now, even those seemed irritating.

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"That was a first order approximation," he said. "The light does not come from *all* directions."

Salvage I appeared in the holosphere. The picture was dim and grainy, a sign that what I was watching was in extreme slow motion.

Light blossomed from its base, spread upward like an all-consuming fire.

Faded. . . .

Vanished. The spacecraft crept away from the center of the sphere, already beginning its downward plunge.

"It originated on the side facing the black hole," I said.

"Yes," Fell confirmed.

"There was nothing between the ship and the event horizon."

"Correct."

"And nothing can escape an event horizon."

"With the exception of Hawking evaporation, which does not appear to be relevant," Fell agreed.

I shook my head. This was not going at all well.

"What about the fireflies?" I asked, grasping for something which might make sense. "Do we know anything about them besides where they originate?"

There was another period of silence as Fell went through the please-and-may-I minuet with the data buffer.

"The spectra are almost identical to the flashes that surrounded *Salvage I* and the probe," Fell reported.

At last, two pieces which fit together. By themselves, though, they told me nothing.

"I have the recordings from the unmanned probe," Fell announced.

A forward view appeared in the holosphere. Fell must have edited the recording, because we were already near the point of closest approach. The Throat was a curve of darkness across the galaxy. The stars wept tears of Daliesque light.

"At this point, the probe has nearly attained its maximum velocity," Fell said. "All systems are well within operational parameters. Very soon we should—ah!"

Light burst from the holosphere. White light, beautiful and dazzling, but touched with every color of the rainbow.

It vanished abruptly.

"Status report," I demanded.

"No damage. All systems functional. The probe has accelerated to fifty gravities. No indication of tractor beams or any other restraints. Flight path diverges from plan. Divergence increases. . . ."

There were no stars, just blackness within blackness. The screen went blank as the signal cut off.

"Stand by for further processing." The Dazzle reappeared. Fell worked the light like a master weaver, cutting the blinding intensity, selecting critical wavelengths, then enhancing them. A silhouette appeared in the middle of the image.

"The Octohedron," I surmised.

"No," Fell said. "Wait."

The light altered with further enhancement. And again. The outline became clear.

I licked my lips. "Are there snooping devices in this room?" I asked.

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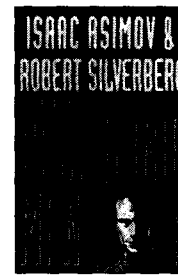

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"Yes, sir."

"Can you disable them?"

"Of course."

"Do so."

Hronk and a slab of beef named Chavez came through the door unannounced. Hronk carried a meter-long neurowand which hummed evilly. Chavez held a splatter laser pointed at my midsection. A red light over the swivel-tip barrel indicated it had locked on me.

"It took you guys long enough to get here," I said. "Magnus must be really busy."

"Make no sudden moves," Hronk warned. "Anything which even looks like resistance will be punished severely."

"Yeah, right," I agreed. "Why don't we save the speeches for later. I'm sure Magnus told you I was to be taken to him without delay."

I kicked myself away from the wall, but not so quickly as to alarm itchy trigger fingers. As I drifted between them, I looked down at the splatter laser.

"Didn't anyone tell you those things are illegal?"

Chavez growled at me in reply.

Out in the corridor, I grabbed a passing strap and let it carry me the entire length of one axis. I was following Hronk; Chavez followed behind, keeping his weapon pointed at my back. As if there were anywhere I could go on a small station in intergalactic space.

Magnus's quarters occupied a full three stories along the end of the axis. It was large, made to seem even larger by dark walls and spot lighting. We entered through a safety lock. Slowly rotating globes of water flanked the entry. Airweed, glowing red and blue, tumbled along the ventilation currents.

Magnus floated cross-legged in the midst of a data console, surrounded by diamond-shaped screens which managed to suggest a throne. He looked up from a recorded report to fix me with a stare.

"You have vandalized part of my security system," he said in a flat voice. "Explain."

"I have made what I believe to be a significant discovery," I said. "I thought you would want it to be for your eyes only. And for any others you can trust. This room is secure?"

"Yes." His eyes narrowed. "What is it?"

"An analysis of data from the probe."

"Let's see it."

I looked quickly back toward Hronk and Chavez. "Are you sure you can trust them?"

"If I can't, then there's no one on the station I can trust." There was a trace of bitter desperation in his voice.

"Fell, show him the Dazzle."

A holosphere appeared between us. It blossomed with that beautiful, unearthly light.

"I've seen this before," Magnus said impatiently.

"I don't think you've seen the results of this type of analysis," I said. Within the holosphere, Fell went through his light wizardry routine. Slowly, a silhouette appeared. Mag-

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nus hunched forward, surprise apparent on his face.

"That's another probe," he said.

"That's what we thought," I agreed.

"But there was no other probe," he protested. "Except for the observation satellites, Cerberus and the probe itself, there was nothing else for thousands of light years."

"That is what the records show," I said, nodding. "And yet, it appears they are wrong."

Magnus paled as he considered the implications. "You were right to come directly to me. Is there anything else?"

I shook my head. "Not yet. I still have to discover what causes the Dazzle, and how that interferes with the functioning of your ships."

Fell had frozen the holosphere with the silhouette of the probe at its most defined. Magnus seemed unable to tear his eyes away.

"I am changing the codes," he said. "You will have immediate access to me at all times. I am also discontinuing surveillance on you. You will make your reports to me alone."

I nodded. The meeting was at an end.

"Actually, it is considerably worse than what we told him," Fell said.

I floated within the sleep netting in a state for which yogis probably have a jaw-breakingly precise term, somewhere between full consciousness and light sleep.

"Can't be much worse than knowing your people are sabotaging your effort," I mumbled. I paused, lulled by the rhythm of my own breathing. After a while, I realized I had not completed my thought. "And that they've changed the files to cover their tracks."

"Actually, it can be," Fell said apologetically. "I've just been wool-gathering the past few hours, asking myself what we could know about the phantom probe. I realized that by measuring its apparent visual size, I could determine how far the phantom was from the probe. I did so. Then I accessed the satellite records to check the area of the space the phantom should have been occupying.

"There was nothing there." He sounded worried.

"That's easy," I said. "Records were changed just like all the others. Didn't get the probe records 'cause they didn't realize you could tease the phantom's silhouette from the Dazzle."

"I suppose," Fell said, uncertainly, "but that is not what troubles me." He seemed to be pacing the room, gnawing on his mustache. At the same time, I was perfectly aware of how difficult it would be to pace in free fall. Even if you had a body.

"You see, when you approach the event horizon of a black hole, gravitation itself accelerates you to near lightspeed. Specifically—"

"I'm nearly asleep," I protested, turning in the netting. "I am asleep. Spare me the figures."

"Sleep may be a very fruitful time for work," Fell said earnestly. "It is thought that dreaming allows a freer association of ideas which is the basis for creativity. In fact, my own pro-

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gramming incorporates a bias toward random memetic interaction which is supposed to model human creativity."

Deep, heavy breathing seemed the only reasonable response to that.

"Ahem. Well, then," Fell continued. "The image of the phantom does not change for the few seconds it is visible in the Dazzle. It neither approaches nor recedes. It neither rises nor falls. This would be easily explicable were the probe traveling in a straight line. That, however, is not the case. At this point, the probe is beginning to swing around in an arc. It follows that the phantom, being farther out from the event horizon than the probe, must be describing a larger arc. If it stays even with the probe, it must be moving faster than the probe. In some ways, the effect is like a whip: the hand moves at a relatively slow speed, the tip cracks the sound barrier."

There was silence. "So?" I muttered.

"So the speed of the phantom is precisely calculable, if one knows the speed of the probe and the distance to the phantom. When I run those figures, the result is that the phantom was traveling faster than the speed of light."

"That," I said distinctly, "is impossible."

"Exactly," Fell agreed.

I woke eight hours later, at the beginning of "day" shift. Fell was quiet as I dressed. Either the whole conversation had been a dream, or he had computed the solution that had occurred to me just before waking. The data transmitted from the probe showed an impossible situation. *Ergo,* the data were false. This set of records had been falsified by the addition of something which had never happened.

In any event, it was past time to stop mulling over impossible situations and contradictory facts. After breakfast, I made my way down to the shop section, determined to uncover my own evidence.

I wondered how much cooperation I would receive. One reading of the situation would be that I was an overpriced hotshot brought in to set right what had been fouled up by the local talent. That might even be the best impression I could hope for. After all, it seemed more and more likely that I was looking for a group of individuals engaged in falsification of records and sabotage. A group which had been responsible for the death of the crew of *Salvage I.*

On the way, I stopped in Isobel Ouko's office, hoping to talk to her before she went off third shift. The chief scientist should know who I should talk to in order to get things started.

"About time," she said, as I outlined my plan. "We've been paralyzed ever since we've lost the probe. I'll introduce you to our shop engineer," Megan Rosenfield."

Rosenfield listened with interest in her office overlooking the manufacturing bay. "It's pretty simplistic," I admitted, as I finished.

"Hell, at least it's a beginning," she said. "We can get fancy later." She had

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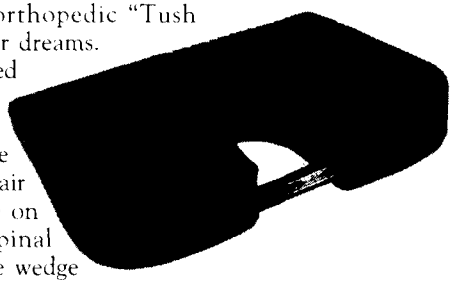

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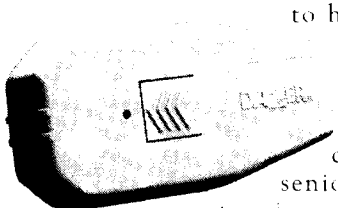

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been murmuring into a throat mike from time to time as I had been speaking to her. Now she projected schematics onto a screen with a scale along the bottom, rotating them slowly so I could get a complete view.

"This is your basic shell," she said. "I can get the 'bots busy on it right now. From what you say, you want only a basic sensor package with no more than minimal data flow. No propulsion unit at all. Simple and cheap. Penurious Rex himself would approve. Come back in three hours and the first one will be ready to launch."

A tube of plastic was already extending itself from a wall into the center of the bay. As we left, one end was swelling as if it were a child's balloon being inflated.

"What do you expect to discover?" Isobel asked as we entered her office.

I shrugged. "I have no idea. If I'm lucky, I may be able to trigger a Dazzle that doesn't send the probe hurtling into the Throat. The fact that the second Dazzle was weaker than the first suggests that that's at least a possibility. Being able to examine a probe which has been attacked should tell us something. At the very least, we will have a more precise measurement of the critical distance, and more opportunities to correlate the Dazzle with the behavior of the Octohedron."

There was also the possibility that I might learn a great deal more. Fell had loaded the trajectories I wanted into Rosenfield's manufacturing system. These would be loaded into the probes when launched. Along with each set of instructions, he had added a stealth logic bomb, set to go off if anything tried to change the trajectories or interfere with the transmission of data.

Isobel floated in the midst of her data screens, brooding. "Perhaps the problem is that we have come too far too quickly."

"Why do you say that?" I asked, jarred out of my own thoughts.

"I think we've been caught in our own trap," she said. "All those impulsive colonists, so sure that life will be perfect if they can get to their unspoiled Edens. They're so surprised and hurt to discover how difficult, how *alien*, the Universe is."

I kept quiet, uncertain of where this was leading.

"I took a history of science course when I was an undergraduate," she continued. "I was fascinated by what I learned of space flight in the latter part of the twentieth century. In some ways, it was a time of stagnation. Lack of vision on the part of the major governments meant that only chemical rockets were available for exploration long after they should have give way to solar sails and nukes.

"Yet those very constraints were the basis of their greatest achievements. Look at the *Voyager* missions. Because their propulsion systems were only barely adequate, they had to choreograph gravitational ballets that not only took the craft on the grand tour of the outer Solar System, but also arranged for flight paths that would take them close to the major satellites. The instrumentation had to be precise enough to measure the ex-

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pected magnetic fields and heat fluxes, but flexible enough to capture things completely unexpected, like the rings of Jupiter. And all of this had to be sufficiently hardened to withstand solar flares and intense radiation belts.

"When I was a kid, my teachers taught me to admire the Plains Indians of North America for the economical way in which they used every part of a slaughtered buffalo. Those Indians had nothing on the designers of the *Voyager* missions.

"Comes the twenty-first century, and in short order we have impellers and Maya drives and distance is eliminated. Now, if you have a question about any celestial object you can see you don't cogitate and theorize and construct models and run computer simulations. No, you file a proposal, and, if you're lucky, Stellar Survey sends you out to take a look."

"Sounds like a big improvement to me," I said.

Isobel nodded judiciously. "In most respects, it is. But sometimes, it's too easy. Maybe a star behaves in an odd way. You fly out, and find yourself in the middle of a supernova explosion. Or you look for a black hole—and find something spinning around it you could never have imagined. And even after it's killed you, you still don't know what's happened."

"You're tired," I suggested. "I stopped you just as you were going off shift."

She ran a hand through her hair, a gesture frustrated by the net that kept it from expanding in a weightless nimbus. "I *am* tired," she agreed. "I'm tired of the paranoia and suspicion that has nearly paralyzed this expedition. I'm tired of not knowing why my friends died."

She kicked herself toward the door. "I'm going to grab some sleep. Maybe I'll be more human in a few hours. Or at least coherent. Let me know if anything turns up."

Rosenfield began launching miniprobes at ninety-minute intervals. I parked myself in a corner of her office. On the main screen, ellipses crept away from the circle which marked our orbit. Each succeeding ellipse was just perceptibly thinner than its predecessor, just a little bit closer to the critical distance.

I was tossing stones into a lake to see what creature would answer from the depths. I stood at the entrance to a cave. Was there a sound of movement in the darkness, the scrape of claws on stone, a vibration felt rather than heard which might be a growl?

The hours drifted by. My brain began to shut down from disuse.

"Is it me," I asked Fell, " or is absolutely nothing happening?"

"Little of note is occurring at the moment," Fell conceded. "There are a some minor anomalies in the most recent flight paths. I will ask Engineer Rosenfield to recalibrate the launching cannon."

With Rosenfield's permission, I hooked Fell into a one-way data feed. "Give me a buzz if there's anything noteworthy. I'm going to get some exercise."

I had passed the door to the fitness

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room on my initial exploration of the station. On entering, I discovered that it was a state of the art facility. Orion might be cheap in some respects, but management had clearly learned that failure to provide the best in a free fall environment was a false economy. An autodoc just inside the door identified me and did a quick check on everything from blood pressure to calcium loss to immune response. It then informed me of the minimum level work-out that would be permitted. This would be automatically programmed into whatever apparatus I chose to use. The message was clear: if Orion had to pay for all of this, then the employees *would get the maximum benefit* from it.

I chose an arcade action simulation and zipped myself into a virtsuit. The fitness room disappeared. I was on a warm, sunlit plain. Tall, golden grasses rippled in a breeze which blew cool across my brow.

Half-hidden forms crouched within those grasses. The wind carried throaty roars across the distance.

A beaten path lay before me. I began loping along it, away from the shadowy forms. Constantly changing numbers in the upper left corner of my range of vision kept a running total of my exercise points. The suit resisted my movements in a way sufficiently analogous to gravity that I lost awareness of the difference after five minutes.

From what I remembered of these types of programs, I would be allowed a few minutes warm-up time so I would be reasonably loose when the real action began. A curved line appeared beneath my score. The dot's position on the curve showed that heartbeat and respiration were right where they were supposed to be.

Several loud roars sounded behind me. Looking back, I saw three saber-toothed tigers break from the cover of the grass and begin loping after me. Warm-up time was over.

There had been a steadily increasing roll to the land. Now small creeks, the size of drainage ditches, began to interrupt the path. I had to leap over them. *I always hated broadjump in school.* The tigers had to go up the creeks to where they could cross on rocks. Otherwise, they would have run me down immediately.

Just when I was sure I could not make another jump, the nature of the obstacles changed. Steep walls blockaded the path. I had to jump for handholds and pull myself over.

Makes sense: the upper body needs exercise as much as the lower.

After half a dozen of these, I felt my stamina going. Even though I was near the end of this module, I was not at all certain I would make it all the way.

No more walls appeared in my path. Now there was just a clearing which ended at a gorge. A large tree leaned over the gorge, its limbs extending outward so that they almost touched the limbs of another tree growing out of the far side of the gorge.

Without any further obstacles to impede them, the tigers closed on me fast. I sprinted across the open

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ground and leapt for a low branch. Hot breath washed across my ankles as I swung myself up.

My path led half way up the trunk and out along a level branch. A vine hung over the far end of the branch from the tree on the other side. To terminate the module, I would have to run out to the end of the branch, grab the vine, and swing to the safety of the far side.

Sweat stung my eyes. My chest heaved, straining for air. My muscles trembled with fatigue.

The tree shuddered as a saber tooth launched itself onto the trunk and began scrambling up. Definitely time to go for it.

The top of the tree limb was as flat as if it had been planed down. As I neared its end, however, it began bouncing under my weight. OK, then, I would use it like a diving board and spring up to the vine.

I crouched, jumped— The world twisted. I was plunging straight down, wind whistling past my ears. Crocodiles in the river far below looked up with opening jaws at their approaching meal.

Unfairunfairunfair.

Something tremendously strong seized my neck and *ripped.*

"You OK, buddy?" A brown-skinned, blocky face, brown eyes staring at me from such close range that the blood vessels in the whites of his eyes resembled writhing red snakes. The badge on his coverall read DR. ROBERT FARMER *Medical.* Behind him, the fitness room lay calm and silent.

"What happened?" I gasped, trying to reorient myself.

"Autodoc was monitoring your workout," Farmer said. "When your readings went off the scale, that set off an alarm. When I came in, you were thrashing around in your virtsuit."

I licked my lips. "Something's wrong with the program," I said. "I was trying to leap, but something changed it to a plunge."

"What program?" Farmer asked.

"Saber tooth."

He swore. "That program was supposed to be pulled a month ago. There's a bad line of code toward the end which reverses whatever action you take. Tends to freak people out."

"Tell me about it," I agreed, stripping off the rest of the virtsuit. Then I paused. Air from the ventilators pushed me toward the wall.

"You sure you're OK?" Farmer demanded.

"Yeah," I said, bringing myself back to the present. "I was just thinking of something."

Farmer insisted on putting me back in the autodoc for a level one physical. After he reluctantly turned me loose, I kicked myself over to the showers. While forced air and hot water cleansed the sweat from my body, I tried to recapture the train of thought Farmer had interrupted. For an instant, it had seemed to me that the answer had been given to me, that in fact I had had it all along, but had been too dense to realize it.

A line of bad code. Magnus had realized that something like that in the navigation systems might have sent both *Salvage I* and the probe hurtling

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down the Throat. Telemetry from both indicated that had not been the case. Neither he nor Fell had been able to find any indications of tampering.

Outside, crew members were hurrying to their stations, kicking through the shaft like so many schools of minnows. Several groups hung along the sides, out of the travel lanes, engrossed in hushed conversations. I hardly saw them. The idea was so close to consciousness that all I had to do, it seemed, was be still and it would surface on its own.

When it finally did, it seemed so ridiculous that I tried to dismiss it. It nagged me all the way to Rosenfield's shop area.

I strapped the comp matrices back on as I studied the wall displays. None of the probes had been lost or triggered a Dazzle, though the most recent ellipses were looking increasingly odd.

I asked Fell if he had access to files on optical geometry. When he replied that he did, I outlined the simulation I wanted him to run.

There was a definite pause. "I have been such a fool," Fell said. "I had access to the answer all along, but lacked the wit to ask the correct question."

"It works?"

"It explains everything," Fell replied. "The Dazzle. The destruction of *Salvage I* and the probe. Even the fireflies."

"Great. Notify Dr. Ouko. Tell her we need to put together a presentation for Magnus."

Another pause. "I fear that is not possible. While you were in the fitness room, Magnus ordered the formation of a second crew to penetrate the Dazzle. Dr. Ouko was one of those selected. She is receiving her mission briefing at this time."

None of us were born immortal. (We'll consider statistically insignificant the number of children born since the Maya drive made possible a limited reconciliation of immortality and procreation.) We grew up in the shadow of inevitable death. Sometimes parents and grandparents died suddenly, from strokes and heart attacks. Otherwise, we saw them becoming increasingly frail until they withered away to nothingness with scarcely a clear dividing line between life and death. Whether anything was said or not, we learned that the same fate awaited us.

Then, in a less-than-ten-year period, came the series of discoveries which first stopped aging, then actually rolled back the years. As a by-product of AIDS research, the immune system was made virtually impregnable. Disease disappeared.

Amid all this, there grew a hidden unease. The healthier we became, the brighter the prospects for all humanity, the more it seemed that there must be an outstanding tab somewhere accruing interest.

I had the feeling the bill was about to be dropped on my table.

Back in my own quarters, I tried to sort things out.

"Why has Magnus attempted a manned expedition now, for God's

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sake?" I asked.

"Since Magnus and all other members of the expedition are currently incommunicado, I cannot provide a direct answer to your question," Fell said. "However, it may be significant that a priority one coded message was received from the Orion home office four hours ago. I find it reasonable to infer that the pressure for results has increased dramatically."

I nodded. "Suppose, then, we told Magnus we had his problem solved. Would he believe us?"

"It is difficult to craft a verbal explanation which does not sound paradoxical and contradictory," Fell said. "Magnus, unfortunately, does not have the mathematical background for any other explanation."

"So he might not believe us."

"That is a definite, if unquantifiable, possiblity," Fell agreed.

"If we don't tell him, or we tell him and he disbelieves us, everyone on his expedition will die."

"That much is a certainty."

"Suppose I were to join the expedition?" I suggested.

"All will live, or all will die," Fell said simply. "I estimate that your odds are fifty-fifty."

I was walking down a logic maze, discovering path after path to be a dead end. "Well, what am I supposed to do?" I asked in frustration.

"I have only incomplete memories of the system from which this shadow was downloaded," Fell said. "There are hints that it was sufficiently complex to manifest truly independent volition, to make judgments of moral weight. However that may be, this shadow which speaks to you has no such ability. It is merely terabytes of memory strung together by a hodgepodge of AI routines, all overlain by speech mannerisms you chose several years ago."

Which was just a long-winded way of telling me I was on my own. Actually, I couldn't understand what Fell found so difficult. In its basics, it boiled down to a simple either/or choice with attendant possibilities, the same sort of choice presented to Achilles: a short, glorious life, or a long, uneventful one.

Some damned things never change!

Magnus was dumbfounded when I volunteered.

"This is not required by your contract," he said. He blinked, as if he were having problems seeing me through the haze of his own concerns.

"I realize that," I said. "I want to come because I want to make a contribution. After all, if you break this thing without my help, House of Hawks won't get its 10 percent."

"You believe the Dazzle is getting progressively weaker," Magnus said. "The Octohedron's power sources must be running down. And because of that, we will survive."

His sudden eagerness was almost pathetic.

"I think we have a good chance," I said. "But I need Fell in a direct hookup to the on-board computer. No data buffer."

Magnus looked like he would object.

"Fell was able to discover the sec-

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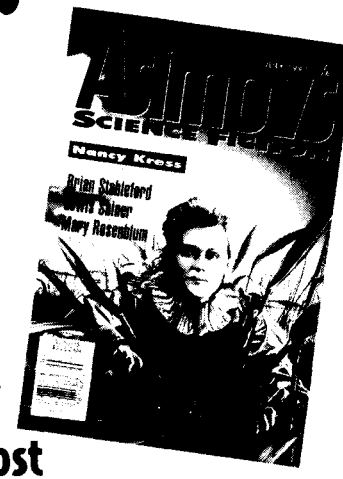

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ond ship in the Dazzle with his data analysis programs," I said quickly. "This time we may not have the leisure to work through complex data protocols. We may need reactions as close as possible to instantaneous."

Still Magnus hesitated. Then he shrugged. "Maybe an artificial person is the only one who can be completely trusted. Your presence will be good for morale, in any event. Report to the docking bays in six hours."

I was dismissed. I had won. I hoped my prize would not be starring role in a spectacular funeral.

Crew stations on *Salvage II* were cramped. I was assigned the co-pilot's chair. I had not met the pilot, Lee Tran, before I strapped in next to him. Isobel was behind me at the navigator's station. Hronk occupied engineering across from her. In the command chair, where he could keep an eye on us all, Magnus sat and glowered.

Isobel had caught me shaking my head over the crew list an hour earlier. "Hronk's an engineer?" I asked incredulously. "I thought he was just hired muscle."

"Everyone on the station has multiple specialties," Isobel said drily.

"Your problem is, you're looking at these selections the wrong way," she continued. "Tran was selected as pilot because he is thought to be a malcontent, and because he was largely responsible for the pre-flight preparations of both *Salvage I* and the probe which followed. Magnus thinks he had both motive and opportunity for sabotage.

"Likewise, I am here because there is a history of friction between the management and scientific cadres. It is also believed that I had the ability to alter the telemetry records and so conceal the evidence of sabotage, though no one has yet been able to actually explain how I accomplished that miracle.

"You see, we are supposed to be Magnus's insurance policy. If we caused the destruction of the first two vessels, we should have at least sufficient concern for our own lives to make sure *Salvage II* returns safely."

It made sense. The same sort of sense which started from a desire to hire specialized help and ended with blowing up the power generators of a cloud city.

"When you come right down to it," Isobel said, "you are the only member of this expedition selected solely on grounds of your expertise. I hope that means you really know what you are doing."

"Me, too," I muttered.

I hoped so even more fervently as I strapped myself into the co-pilot's chair. Fell's comp matrices unsnapped easily from their belt. I was plugging them into the main board in front of me when Tran reached out a restraining hand.

"Relax, Mr. Tran," Magnus said from behind us. "Mr. Wyatt is installing those matrices on my orders."

Tran held me for a moment longer before letting go. His eyes were dark pools, almost impassive enough to conceal the fear swimming just beneath the surface.

"Very well, sir." He released me.

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"Sorry."

"No problem." Which was the truth. I had been worried about the exact distance between us. Now I knew that it was less than an arm's length.

Tran and Hronk went through the pre-launch checklist. On his own initiative, Fell generated knobots and sent them scuttling through the ship's minds, looking for viruses, logic bombs, and anything else that could not be immediately identified.

"Everything's green," he assured me.

The countdown wound down to zero. A *clang* echoed through the hull as we disengaged from the lock. *Salvage II* drifted slowly away from Cerberus. Tran engaged the impellers smoothly, swinging the vessel onto the correct vector and then increasing the acceleration to one gee.

The mini-screen attached to my arm rest displayed the flight plan. It was to be an ellipse similar to those for the probes I had launched, only with the major axis much compressed. The point of closest approach would be just within the Dazzle. Whatever was pushing Magnus apparently did not require an immediate exploration of the Octohedron.

I just wished I had been given time to run the same flight plan with one of my unmanned probes first.

The Throat grew steadily on the main screens, all-devouring emptiness fringed with a mane of starlight. It was all too easy to think of a gigantic mouth awaiting its next appetizer. I closed my eyes, knowing there was nothing I could do until we entered the Dazzle.

That was a mistake. Tran cut the acceleration. We were now in free fall. Behind my eyelids, I was ten years old, experiencing the terror of heights for the first time in the Rockies.

And McCall hurtled toward the ground, clouds steaming up past the windows. . . .

I forced my eyes open. Both hands were white, clutching the armrests. I peeled the fingers loose, one at a time. Tran was eyeing me curiously.

"Touch of falling phobia," I explained, trying to smile. "No problem, really."

Tran grunted and turned back to his instruments.

I dozed. Beyond an individual's limit, terror is extremely enervating.

The second countdown was approaching its end as I awoke. The forward viewscreens were split like a harlequin mask: complete darkness to the left; stars crowded together, their light pulled like taffy on the right.

". . . One, zero."

The stars collapsed into a glorious blaze.

"The Dazzle."

The beauty of the light was so great that I almost forgot what to do next.

"Fell. Magnify."

He sifted and sieved the light. The silhouette appeared in front of us.

"Damn!" Magnus said. "So there was another vessel! Now they intend to murder us as they did the *Salvage I* crew."

"Not just one," Isobel corrected.

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"Check the side screens."

I nodded as the images became clear. Each screen showed an identical vessel, but from a different angle.

"We're surrounded," Magnus said. "But . . . where have they been all this time? How could they suddenly appear?"

"We're beginning to drop!" Tran announced.

"Fell. Stage one."

There was a click as my acceleration harness opened. Cramped quarters and free fall would make this tricky. I braced both feet securely and swung. Tran never saw it coming. My fist connected with his jaw. His head snapped over, hit the bulkhead, and bounced back in a series of slowly diminishing arcs.

Stage one complete.

"Wyatt!" Magnus yelled. "Have you gone crazy?"

Nearer at hand, Hronk was making growling noises as he struggled with an acceleration harness which refused to open.

"I sincerely hope not," I replied.

"Then are you working with the saboteurs?"

"We are dropping more rapidly," Isobel said urgently. "If you don't immediately increase our acceleration, we will be pulled below the event horizon."

"Wrong," I said. "I think."

The Dazzle, and our escort, disappeared. Nothingness yawned below us.

"Fell. Stage two."

Salvage II began to rotate on its short axis. The Universe seemed to pinwheel around us.

* * *

There was a satisfying clang as the airlocks mated. In less than ten seconds, the light flashed green. I cycled through the airlock and kicked myself into Cerberus station.

There was a flash of pain as a neurowand jabbed into my side. I curled into a tight ball, all my muscles spasming at once. Dimly, I was aware that a net had been thrown over me and that I was being towed down the corridor.

I was shoved into a huge room. Light twisted its way through rotating spheres of water on either side of me. Far above, airweed whispered along the walls.

The net parted. There was a prick on my neck, followed by flowing coolness. The upper portion of my body began to relax.

A hand grabbed my hair and twisted. A face loomed close. A face of a man so rich, so powerful that he disdained the treatments of the cosmetobots, a man who seemed to revel in his own ugliness as if it proved that he stood outside the standards which applied to everyone else.

Ottorino Rex.

"You disappoint me, Mr. Wyatt." He began to tick off points on his fingers. His voice was deep and almost musical. "You have assaulted one of my employees. You have pirated one of my vessels. You have kidnapped its crew, putting them in grave danger. And, almost incidentally, you have breached your contractual obligations. What, in your opinion, is sufficient punishment for such acts?"

"We'll start with my freedom and

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an apology for the way your goons greeted me just now," I said. "Then, when I'm comfortable, we can discuss the amount of my bonus for saving your corporate ass."

My hair was nearly yanked out by its roots. Chavez brought my nose uncomfortably close to his teeth. "You will show proper respect for our chief executive officer."

"When you grow up, you'll understand this type of foreplay," I replied. "Right now, I am the one person in the Universe who has brought a ship through the Dazzle. Your boss would like to know how. When I can think of anything beyond how much I ache, I'm going to tell him."

A rumble came from Rex. It took an instant to realize that this was his version of laughter.

"Apply the full dose of the relaxant," Rex ordered. "Then have refreshments brought for myself and my colleague."

Chavez growled, but obediently injected two more doses. My legs uncurled from their fetal position. I stretched, groaning, and began massaging blood back into oxygen-starved muscles.

"Now, you will answer my questions," Rex said, in a tone which allowed for no opposition. "You will tell me how the Octohedron attacked my ships, as well as how *Salvage II* survived the attack. You will tell me the identity of the humans whose ships were in the Dazzle with you. Most importantly, perhaps, you will name the traitors within Cerberus Station."

"Easily enough done," I said, flexing my fingers to drive out the pins-and-needles sensation. "*Salvage II* was able to survive the Octohedron because it has never attacked anything. There were never any ships in the Dazzle except your own. And, despite a greater than average amount of paranoia and back-biting, there are no traitors on board this station and never have been. Your crew has been completely and consistently loyal to your interests."

"Mr. Wyatt, do not toy with me," Rex said. His voice had become as low and dangerous as a panther's. "We saw the flash that enveloped all three of our vessels before they began their plunge into the black hole. What was that, if not an attack?"

"It was starlight," I said. "Simple starlight, some of which was millions of years old."

Rex's frown deepened. "When I have finished, you will be able to confirm everything I say from your own databases. In fact, you will kick yourself for not understanding at once. We should have, you know. Orion and House of Hawks both started out as Librarians, companies whose expertise was being able to strain the glut of data for those facts meaningful and relevant to our clients. Even though I don't know his name, I'd lay odds that you had here an expert who could have explained it all, had he had the chance."

"Who?" Rex asked heavily.

"Your first chief scientist," I answered. "The one you originally picked because he knew celestial mechanics and black holes. The one you got rid of when you discovered the

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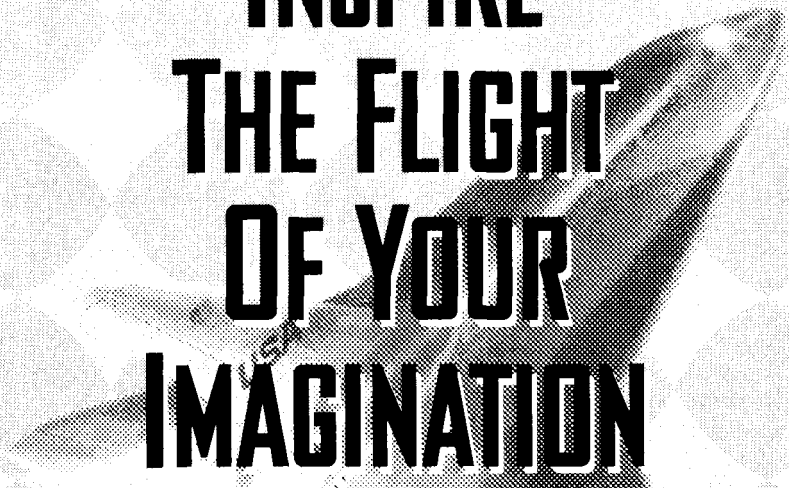

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Octohedron."

"Once we discovered the Octohedron, minutiae about black holes became relatively unimportant," Rex said. "We knew to stay clear of the event horizon. Beyond that, security dictated that the number who knew of our discoveries be kept to a minimum. I therefore determined that the chief scientist should be a xenobiologist."

"Wrong on two counts," I said. "As your current chief scientist reminded me, black holes are unimaginably strange."

"So strange that the laws of nature just change on their own?" Rex suggested, with thinly veiled sarcasm.

"Well, yes," Fell said. "That is almost exactly right."

Rex looked down in surprise. In the excitement, I had momentarily forgotten unplugging Fell's matrices from the *Salvage II* control panel and clipping them back onto my belt.

"That is your AI system?" Rex asked. "The one that subverted the controls of *Salvage II*?"

"The one which made possible your ship's safe return," I said. "The one which, with your permission, will explain the Dazzle."

Rex grunted assent. Fell projected a holosphere. Within it, cartoon images of a black hole floated below a spiral galaxy.

"Mass curves space around it." Animations of light rays leapt from the galaxy, bending as they passed near the event horizon. "The greater the mass, the closer to the center of mass, the greater the curvature."

"Every school child knows this," Rex said impatiently.

"Yes," Fell agreed, "but not every school child knows that at a distance of 1.5 radii from the center of the hole, the curvature has become so great that light curves round in a closed circle."

In the holosphere, the point of view itself began to orbit the black hole. A sphere of light seemed to enclose it.

"If that's the case, why don't we—?" Rex stopped as he realized the answer to his own question.

"We do not see this precisely because it is captive," Fell said. "Thus, a sphere of light is invisible."

"If you think about it," I added, "you'll realize that for as long as this black hole has existed, light has constantly been entering this sphere. Over the course of the last several hundred thousand years, the intensity might have increased to the point that anything coming within the critical distance would be vaporized."

"That did not happen because of what you have called the fireflies," Fell said. The images Isobel had shown me appeared within the holosphere: pin-pricks of light against the darkness.

"The gravity well of a black hole this massive is as wide as it is steep," Fell continued. "So even though it cannot maintain an accretion disk in intergalactic space, it sweeps in a steady if thin stream of dust particles. As they spiral in past the critical distance, light relects off them and we see the 'fireflies.' "

"Each of our vessels was, in effect, just an overly large firefly," I said.

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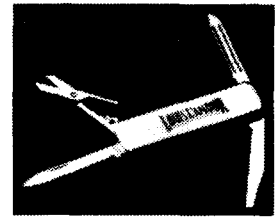

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"However, there is another consequence which was only evident within the Dazzle. When you are at that altitude, your line of sight, although it looks straight, actually curves completely around the black hole. That is what caused the images of the other spacecraft. We were actually seeing our own vessel."

Ottorino Rex was shaking his head. "It's not good enough," he muttered. "You've explained a few minor mysteries of the Dazzle, I'll grant that. But you haven't even touched on the main problem. You haven't told me what pushed two vessels, and nearly a third, into a black hole."

"Centrifugal force," Fell said.

Rex blinked. "Your program is misfunctioning, Mr.Wyatt. It just said—"

"—That centrifugal force pulled your vessels into the black hole. It is not misfunctioning," I said.

"In a way, it's almost as if a black hole has two event horizons," Fell said quickly. "There is the one you all know about, the rabbit hole leading out of the Universe, from which even light cannot escape. But there is a second, invisible horizon, around which light orbits and inside which centrifugal force pulls you inward instead of pushing you away. Or, if you wish, you may want to characterize it as an increase in mass on the part of the vessel which, by this time, is traveling very close to the speed of light. The two concepts are equivalent."

Ottorino Rex was beginning to look dangerously irritated. "All of this is in your own data bases," I repeated. "Access them, and you will know I've been telling the truth."

He stared at me blankly for a few seconds. He had, I suddenly realized, a direct data link attached to one of his optic nerves, and was now taking a computer feed. The technology was as dangerous as it was illegal. In this, as in so much else, Ottorino Rex played by his own rules.

"So you are," he said, with begrudging amazement. "But, you haven't explained anything about the Octohedron."

I smiled. "That's right, I haven't. I can't. The Octohedron had nothing to do with the Dazzle or the loss of your vessels.

"The only thing I know for sure is that the Octohedron is no derelict. We assumed that it had been orbiting the black hole for ages. Well, it may have been around the Throat since it formed, but it has not been orbiting; inside the Dazzle, nothing can orbit. It must be under constant thrust to maintain a circular path around the hole."

Ottorino Rex smiled in return. His smile was larger than mine, and disconcerting.

"It is a relief to find that there are things you don't know," he said. "Were you any closer to omniscience, I might have to take steps for the sake of Orion."

I decided not to ask him what those steps might have been.

White towers, dazzling in the afternoon Sun. I looked down a row of them, visually echoing each other, to the towering cumulus beyond them, and then to the Rocky Mountains, crouching in purple massiveness on

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the horizon. If I let my mind drift, they all seemed to be extensions of the city, no more fantastic than any of the rest of McCall.

A door slid open. Laughter and music spilled out of the room behind me. Overheated air played about the back of my neck.

"Come back and join the party," Hallaj urged. "It needs its guest of honor."

"I'm enjoying the weather too much," I replied. "After a month of recycled air, I want to be scoured back to life by a good storm. Those clouds ahead look promising. In another few hours, the city engineers should be able to charge the auxiliary storage coils with lightning."

In fact, though I did not know how to tell her, I was savoring the experience of being alive too much to desire distractions. In the blueness of the sky, the piercing coldness of the wind, the muscular shadowings of the cumulus clouds building themselves ever higher and darker in the sky, there was an almost hypnotic sensuousness. All over the planet and out to the stars, people were desperately experimenting with new pleasures to while away their endless days. Now I knew what all our ancestors had known: that closeness to death fills the very taste of air with overwhelming beauty.

And that we are always very close to death, however much we tell ourselves otherwise.

Hallaj took a seat on the balcony beside me. "Well, then, favor me with your business acumen. Orion has offered to renegotiate your deal with them. They will pay us 25 billion immediately to be released from your 10 percent deal. Should I accept?"

For an instant, I considered the unlikelihood of this woman, who had built House of Hawks from its beginning as a small Librarians' partnership to its present position as a major interstellar corporation, needing my advice in anything.

"Take it," I said.

I saw the frown from the corner of my eye. "From your report, it appears that the eventual worth of the Octohedron may be incalculable."

I nodded. "In terms of knowledge for humanity, that is probably true. You taught me that House of Hawks wants that which is both calculable and realizable in a finite period of time. Twenty-five billion should give us a definite leverage advantage. My guess is that it will take years of study and exploration, both of which are likely to be costly, before Orion turns a profit on the Octohedron."

I bit my lip. "There's one other thing. I was very proud of myself, explaining the solution to the Dazzle to Ottorino Rex. It always feels good to show off, especially to the competition. Only, now that I have been thinking it over, a few things have been bothering me. The fact that Ottorino Rex put his most dangerous rival in charge of Orion's most important project. The fact that Magnus's position within Orion would be greatly enhanced if he were able to sell both the Throat and the Octohedron. The fact that the one person who could have explained the Dazzle was pulled off Cerberus station as soon as the Oc-

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tohedron was discovered."

I turned to Hallaj, wondering how much of this she had already figured out. "I think Rex knew the secret of the Dazzle even before *Salvage I* was lost. He was setting up Magnus to fail, and he wasn't above letting his own employees die to do it. Magnus would be discredited by the loss of life and resources, and so effectively eliminated as a threat. Only Magnus refused to play by the rules and went to the competition for help.

"Take a good look at our intelligence reports. See if the internal maneuverings within Orion are beginning to look less like a proxy fight and more like preparations for civil war. At the very least, I expect that the increase in factionalism and paranoia will drive the best people out of the organization, making it that much less likely that Orion will be able to solve the mystery of the Octohedron.

"Under the circumstances, 25 billion outright looks a lot better than 10 percent of speculation."

Hallaj smiled. "I shall take your advice under consideration. In the meantime, perhaps, you will suspend your meterological observations long enough to help orient a new employee."

She stood quickly. The door opened and closed. I turned, and found myself looking at Isobel Ouko.

"Hello," she said uncertainly. "You are Thomas Wyatt?"

I nodded, unable to speak.

"I am—"

"I know who you are," I said.

She blushed. "This—this is an awkward situation. Recently, I was under contract to Orion, one of your main competitors. At the termination of my contract, I was subjected to a partial memwipe. It was unpleasant but completely legal. The last memory I have before the gap is signing the contract allowing for it, and my credit balance confirms that Orion kept its part of the bargain.

"My personal records for that time period were purged as well. However, there was one note to myself on my pockomp which was not erased. It said 'Contact Thomas Wyatt, House of Hawks.' "

Her eyes searched my face, looking for something familiar. I wondered which disaffected employee had risked his job by not erasing that one file, and why.

"Do I know you?" she asked.

"You did," I said, "and with luck, you will know me better. Come, let me introduce you to your new colleagues."

The glass door dilated at our approach, and we went in to join the party. ■

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Geoffrey A. Landis

ROBOTS, REALITY, AND THE FUTURE OF HUMANITY IN THE 21ST CENTURY

Three years ago (April 1991) *Analog* published an unusual article: a transcript of a discussion between scientists involved in advanced spaceflight technologies who had been invited to participate in a symposium at the NASA Lewis Research Center, "Vision-21: Space Travel for the Next Millennium." This symposium was designed to bring leading-edge scientists together and encourage an atmosphere of creative thinking.

The second NASA Vision-21 Symposium brought together computer scientists with NASA engineers, and focussed on discussing the potential effects of emerging computer technologies such as robots, virtual reality, and telepresence. Again, leading-edge scientists were invited to speculate on how these new technologies will change the face of the Earth in the next millennium, and once again no one left disappointed by any lack of vision. If anything, the roboticists and computer scientists predicted even more profound changes in the years to come than the interstellar flight proposals and self-replicating probes proposed by the space scientists of the previous symposium! The symposium consisted of invited talks, technical papers, and sessions devoted to interactions between the speakers and the audience. Once again, a panel discussion was run to allow the speakers to interact with each other.

Panelists were Vernor Vinge, well known to *Analog* readers for his hard science fiction, and known to the technical world as a mathematician and computer scientist at San Diego State University; roboticist Hans Moravec of Carnegie Mellon Robotics Laboratory, author of the book *Mind*

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Children; virtual reality pioneer Myron Krueger, who first coined the term "artificial reality"; and NASA scientist Carol Stoker, principle investigator of the project Telepresence for Planetary Exploration. Scientist Geoffrey Landis—also familiar to *Analog* readers for his science fiction—served as moderator and as the technical chairman of the symposium.

We are happy to present to *Analog* readers a flavor of the seminar.

Landis: Virtual reality—the technology to create computer-generated artificial worlds—has been discussed a lot, both in this seminar and in science fiction. Will resolution ever be high enough for virtual reality to be accepted as "real" reality?

Vinge: I think high enough resolution to be entirely satisfactory can be made. Good enough, anyway, for those people who want to retreat entirely into something that is only an interior simulation.

If virtual reality is being run on computers that exist in the real world, there is a basic reason why the virtual world could not be as high resolution as the real world, unless you are talking about telepresence, or something for interacting with the real world.

Moravec: You can send more data as digital video than as analog, because you can data-compress. In a similar way, I think a simulated reality ultimately could actually be richer than the real reality, even though it lives in a computer that lives in the real world.

Vinge: Just so you don't try to include in your simulation the hardware running the virtual reality!

Landis: In fact, we already live in a data-compressed world. From what hits the retinal cells to what goes down the optic nerve, the neural layer at the back of the eyeball compresses the data by something like 98 percent. Most of the information is discarded; the brain reconstructs the image from the compressed data.

Moravec: There are a lot of uninteresting things about the real world which don't really need to be simulated. The insides of rocks, for example. Of course if you are a geologist, you may want to look at one, but there is no reason why the interior of the rock couldn't be created at the point that you break open the rock. And only those rocks that you break open have interiors.

Krueger: There is a long history of simulated experience being more dense than real experience, from theater, to the novel, to film and television. Flight simulation takes the entire experience of mankind in flight and tries to subject every single pilot to the benefit of the lessons learned from everybody's flight experience. Real experience, while it teaches better, is an uncertain teacher.

Vinge: Which of the places would you rather live? Simulated or real?

Krueger: Simulation is going to be real, in the sense that most real work will be done in simulation, most real engineering work. And reality will be just the anticlimax, when we actually end up doing it.

Landis: In Darwinian terms, a person

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lives to survive in a biological niche long enough to reproduce and raise children than can reproduce—

Moravec: That's a substrategy which evolved after life was already around. The idea of generations was an evolutionary venture in itself.

Landis: Once we have computers that are smarter than us but are produced in factories, what is their purpose in life going to be?

Moravec: Competing against each other.

Vinge: You notice he didn't say competing against us.

Moravec: No, we are out of the game. The way I imagine it evolving in the near future is that existing companies become more and more fully automated until some day they are completely automated, from the president to the research department to the factory floor to the sales force. But they still operate in a very competitive environment. They compete initially for our money, because they still need that money to buy land and whatever raw resources they need, but later it's for virgin territory, probably out in space. There is no reason that the man-productive enterprises couldn't be in the asteroids or somewhere like that. They become like organisms, just like bacteria in a soup, or like populations competing for territory.

Krueger: What is the logic that requires them to compete? Already corporations are so interlocked that levels of competition have ceased to exist.

Moravec: Right now is that there isn't much room for expansion because it's almost a zero-sum game. That stops being the case once you have got a frontier. If one of these companies decides they are going to conquer the others, or simply spread out faster, they become dominant.

Krueger: The drives of a computer are not obviously the same as ours, because they don't have the reproductive drive. My suspicion is that all of the computers would just cooperate, and unless we programmed in competition, they would just stagnate.

Vinge: The initial robots that were successful would likely be ones whose creators had a motive for making them competitive.

Moravec: The companies that expand the most end up being dominant. So basically the Darwinian aspect will eventually dominate, given some variation to work on.

Vinge: There are many different styles of Darwinianism. We are used to a strategy that is about living long enough to reproduce and raise children so they too can reproduce. Other strategies look quite a bit different. Bacteria can exchange genetic material with other bacteria, which means that the enterprise has more commonality. The sharing of information and the sharing of success becomes the material that's being replicated, and the competitive scene wouldn't look very much like what animals expect it to look like.

Landis: Evolution often produces long periods without much change. In the fossil record, for long periods very little was happening.

Moravec: The punctuations in those

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equilibria occur when a new environment opens up. You have some species that finds a whole bunch of niches open to it, and evolves to fill all of them.

Landis: And a bunch of niches are now about to open up.

Moravec: Outer space. There are a lot of new things to adapt to there.

Landis: We have been assuming that the things that are going to compete in the 21st Century will be electronic. Biologists are also learning a lot about how living things are put together, and advanced biologically-based systems may be competing against these computation-based systems. For a billion years evolution has been divergent. Very shortly that is no longer to be the case, as people start using recombinant technology to be able to splice in DNA from whatever we choose.

Moravec: The techniques that biology has come up with are pretty much for the range of liquid water, which is very rare and doesn't exist in most of the Universe. Structures made from amino acids are OK, in this liquid water range, but you don't find the strongest materials or the fastest computing there.

Landis: But you certainly find very high information density.

Moravec: There is nothing to stop robots from using DNA. What I think is actually going to happen within 50 years is that biotechnology and conventional hard technology shrinking down to atomic scale will form one seamless technology where you can use anything from anything to design whatever it is you are designing. Whether it's biological or not will be a matter of arbitrary definition. But I think that, for most of the things that are built a hundred years from now, you wouldn't recognize most of the components as having biological origin.

Landis: So the line between organic and inorganic is going to become a fuzzy line?

Moravec: You have a set of techniques invented by evolution to manipulate matter at the atomic scale. Once you understand it well enough to put into your engineering design work stations, these are just techniques like any other techniques. So you can combine them. One of the things that biology is very good at, and there isn't any obvious direct replacement for in the near future, is the ability to construct at nanometer scale. So programming biological assemblers to put things together, maybe even things of other materials, might be of use in the factories, if not in the end products.

Vinge: That was one of Eric Drexler's stepping stones to development of nanotechnology.

Landis: How can an intelligent being design an algorithm which is more intelligent than it is?

Vinge: If "design" implies that you understand what you have built as well as you would understand a cabinet or even a television that you had built, then you can't.

With the largest computer systems now, the idea of software development is taking a distinctly different turn. Instead of trying to actually write code to do stuff, the procedure

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is more like turning loose the tools you already have to create partial or possible solutions, and then using other tools—including your own personal gut feeling for how well the intermediate solutions look—to cull from the possible solutions you get. The particular steps may not be entirely understood, but the overall understanding comes in setting up the parts, experimenting, watching what has happened, watching what works well, and doing more of it.

In the end, the final creature that was made—even if it was of merely human intelligence—would not be understood by the critters that made it. But that has been true for all of us—or everyone who has children—in large amounts you don't understand the creature that you created. And so it does not sound to me like something that is intrinsically illogical.

Krueger: Chess-playing programs merely consider the local future. But they could do an exhaustive search of that, which always struck me as exactly what humans *couldn't* do. There are lots of ideas that come up and seem immediately obvious when they are discovered. Humanity in aggregate has not shown itself to be that good at finding the next obvious step—or, the step that is obvious after the fact.

Moravec: In the '70s, all computer vi- programs and motor control ms were hand coded. They had of the dynamics set up be- nd those never really There were always o be tweaked to actually make it work. But it was necessary to code everything as efficiently as possible, because you had barely enough computer power to do it even then. It still took an hour to process a scene.

Now that the computer power is about a hundred times higher, the programs that work the best are learning programs. The few knobs that you adjusted in the old program have now become several thousand knobs, and you have a program which evaluates the performance of various settings, and keeps tweaking until the performance is optimized. And the results you get there are much, much better. I think in the future there will be far, far more of that in almost any intelligent system. At the factory or in the field, this thing is going to learn most of its behavior.

Landis: What makes us think that as these programs encounter the real world and learn, that they will become not just faster, but actually smarter than us?

Moravec: Well, I think if they are like us and faster, they *are* smarter, because they are able to tackle problems that we can't tackle. They are able to out-compete us in almost any situation. We are able to handle almost arbitrarily big problems by sitting down with enough paper and enough sharp pencils. But of course we have finite windows in which to do this, so that limits the maximum problem size. If they are faster and have the same window size, they can handle bigger problems.

Audience Comment: The very first adding machine was faster than a hu-

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man at one particular task. We are talking about more generalized task-solving processes now, but you are still talking about speed, not intelligence. We don't have a way to recognize or really even conceive of an intelligence that would be different or greater than ours, any more than you can assume that a rose bush can understand the intelligence of the deer that's eating it.

Moravec: I am not saying there aren't such things as clever algorithms that could be in these things, which some machine might have and another machine might not, but the fact is that even those algorithms can be found by searching, if you have a criterion for what you want. The criterion can even be random.

Landis: How do we overcome barriers to implementing new technologies? How do we get from where we are to where we want to be?

Krueger: A lot of people think technology is moving rapidly. I think it's amazingly slow, and I think one thing is that there is a peculiar perspective that you will get out of any American manager, that ideas are cheap. Well, you can go through a whole list of multi-billion dollar enterprises that were one-sentence ideas. But we have this point of view that ideas are cheap, so we don't act on them when we have them. The American research plan is you put an idea or the seminal research in a wine cellar and you wait for it to age.

Expert Systems didn't work in an interesting way, so they weren't researched. That didn't mean that they couldn't have been useful for many purposes, but for 15 years nothing was done in Expert Systems. Neural nets were proven not to do everything, so they weren't allowed to do anything.

We have a tension in research between the search for truth—the search for the nand-gates that make up intelligence—and the thing which produces results. We have a broken conveyor belt. We have the researcher out there digging a hole throwing dirt, but there's no conveyer belt from conception to production.

We have to have a more aggressive stance on ideas. If you have an idea, the idea should get acted on unless everybody wants to be doing the exact same research. We have to have more smaller projects, and encourage diversity in the research community rather than this herd instinct.

If you are a ditch digger, they give you a shovel. Junior researchers should be given some money, period. Research moves slowly? No, *funding* moves slowly. You have got two kinds of researchers. The ones that believe in what they are doing will do a lot on a little. But our system encourages the top predator, the lion who lets the hyena make the kill and then waddles over and pushes them aside and eats. That is the Darwinian solution, but it doesn't lead to much diversity.

Moravec: The [U.S. Department of Defense] Advanced Research Project Agency's original slogan was fur people, not projects, which did s to work. Canada has a policy c viding small amounts of mc

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research. Certainly, you can point to examples where that works wonderfully. You can also point to examples where the big money approaches in the United States worked: you couldn't have gone to the Moon with small grants.

I think there is no answer, no simple formula that is going to provide the best results in all dynamic circumstances.

What you would want, I suppose, is some kind of Darwinian process which would weed out research funding strategies, but I don't know how to implement that.

Krueger: We have one right now.

Moravec: Different countries competing.

Krueger: Yes.

Stoker: If we really are in a situation where in 50 years we are going to build machines that are going to put us out of business, is that really where we want to be?

Krueger: I believe in Parkinson's law, so I don't think there is going to be a shortage of things we want to do. We will invent tasks for ourselves.

I think that the unhappiest people I have known have been the people that didn't have anything they had to do. But there is a momentum to what we are doing, and there is a competition to get to this place you don't want to go. And if you don't get there first—

Stoker: Earlier you defined that something is more intelligent than you if it puts you out of business; it's better than you at whatever you do. We're heading for a collision course here.

Krueger: But there are a million things that we have already conceded to machines, or to animals.

Moravec: It seems to me that civilized life is in fact a rather unnatural state, given our genes. Much of the stress of civilized life is because the number of people we interact with is large. We are very well suited for life in tribes of 200 people. This technology may lead to free time rising again, so we can live much in the way that hunter gatherers lived, off the fruits of the land—except the land in this case is robots producing well beyond our dreams.

Stoker: Did hunter gatherers really have much free time?

Krueger: Well, actually, some of them did. A lot of the primitive tribes had more leisure than we do.

Stoker: But how about when you get infinite free time? If the machines are more intelligent than you in everything?

Moravec: They just become part of landscape. Just like all other technology, it just becomes part of the landscape.

Krueger: I would like to speed up time, just because it isn't happening fast enough. If we would just accelerate the process, I would get to see more of it.

Landis: In computer terms, that simply means slowing down your processing speed.

Krueger: That's easy. ■

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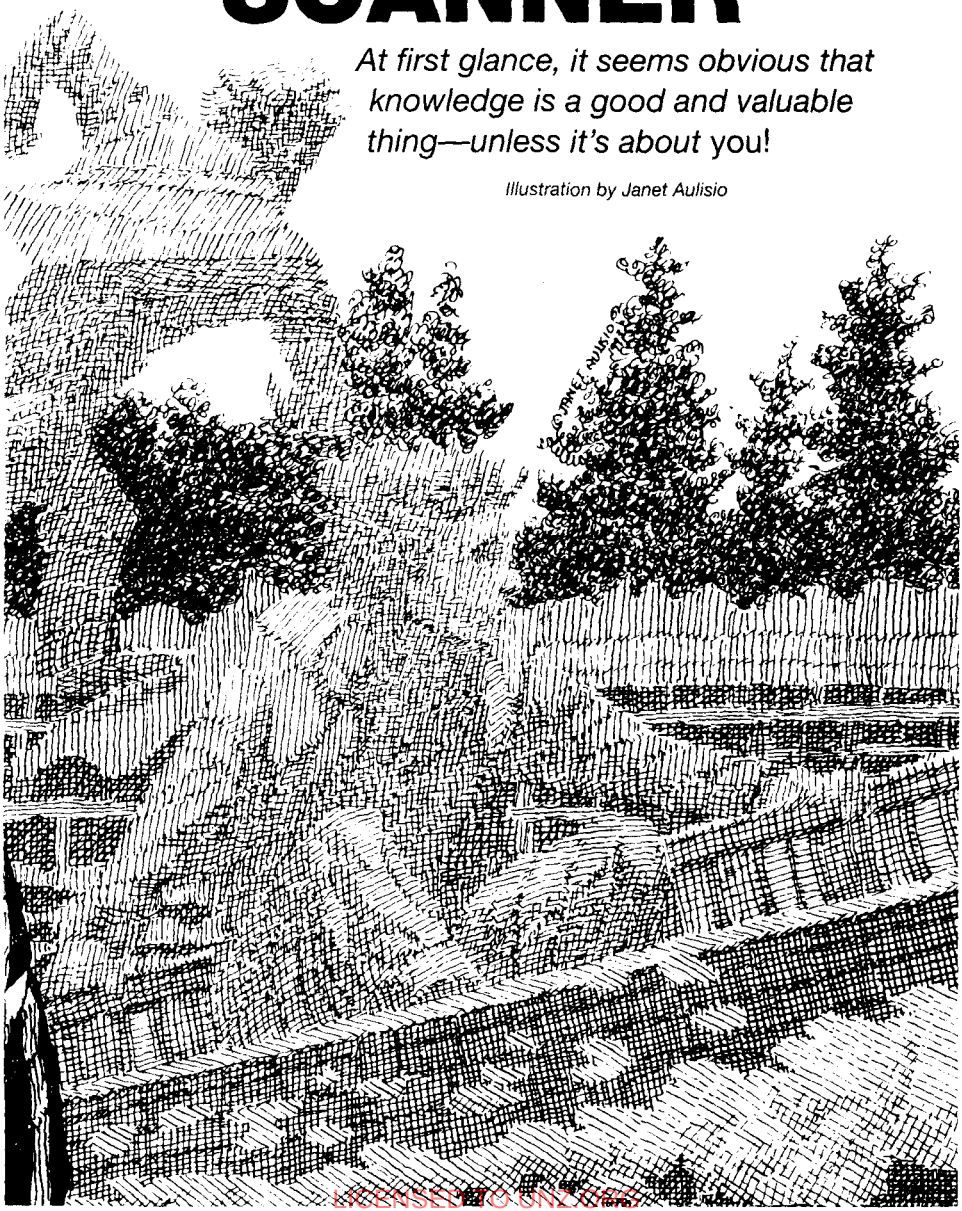
Hayford Peirce

PANDORA'S SCANNER

At first glance, it seems obvious that knowledge is a good and valuable thing—unless it's about you!

Illustration by Janet Aulisio



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"Dad? Can you come over to the clinic after dinner? I think—I *know* —we've got troubles."

Samuel Garraty Ferron, the junior senator from New Mexico, scowled at his daughter's small image on the desk phone. "Troubles? What kind of—"

"That's what I want to talk to—"

"Come over here for dinner and tell me then. Marianna's got a stuffed veal breast cooking, I know you like that. We can—"

"All right, I'd like to have dinner with you. Roderick won't be with me, though: he's down in Santa Fe. But don't say anything to Marianna about what I just said. I'd rather tell you about it at the clinic."

"Right, see you at six."

The screen went blank and Sam swiveled away from his desk with a worried frown. What kind of trouble could Emily be talking about? Husband trouble with Roderick Bantry? Sam had never much cared for the man, but as far he could tell, Emily was genuinely in love with him. Financial problems? With all the money she had inherited from her murdered grandparents that seemed unlikely. Something to do with the clinic? As far as he knew, the Sunny and Harmony Hallowell Trauma Center—one of six accredited medical centers in the country with the use of an unrestricted 3-dimensional O-CLIP computer—was doing beautifully.

Marianna? A sudden icy pang of fear ran thorough him. Could it be something about his wife's health, something that Emily didn't want Marianna to know?

Sam pushed the thought to a corner of his mind, his lips tight. Whatever it was, he'd learn about it soon enough. In the meantime he had other problems. Senator Harcombe had just called to—

The door to the study slammed open and Sam's ten-year-old son, Bruce, burst into the room. His eyes glistened with barely suppressed tears. "Mommy's so dumb!"

Sam struggled to keep his voice patient. "Don't use that word when talking about adults, any adults, and particularly about your mother."

"But it's true: she *is* dumb!"

"Bruce! What did I just—"

"But it's true! It's true! She just wiped out *everything* on my computer when she was cleaning my room!"

"Everything?"

"Well, *almost* everything. Everything I was working on, everything I—"

Sam's fingers drummed on the desk top as he considered his son. Unlike his much older half-sister, who was tall and lean and had inherited her father's fair skin and clear blue eyes, Bruce was tanned and wiry; his dark good looks clearly came from his sultry mother. "Then I have a suggestion for you, young man, a suggestion which has now been ratified by the Congress and is the official law of the land: from now on you will clean your room yourself."

Bruce's eyes widened in dismay. "What? Clean my—"

"And back up everything you do on your computer. Aren't you the great computer expert? Isn't that the first

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thing even non-experts learn to do, to back up?"

"Not if dumb people don't fool around with my stuff! Why can't Mommy be smart like *Emily?* She's an old woman too and *she* knows how to—"

"Bruce, that's enough! Go to your room and stay there till dinner! I'll come up and talk to you about manners and respect and a number of other things you seem to have forgotten, after you've had a chance to consider them on your own for a while."

"Aw, Dad, *no!* You *know* you said I could spend the night in my camp! I was just getting ready to leave when—"

"Your date with your tree house has been cancelled until further notice. Now go to your room and reflect upon politeness."

"Aw, *Dad!*"

"Wait! How much money do you have? Let's see your DC."

Scowling, Bruce handed over the shiny green and silver debit card that had all but replaced cash about the time Sam had been his son's age. "Well, put your thumb on it!" Bruce complied; the card showed a balance of $11.43. "Fine, plenty of money to get you through the end of the month. A week's docked allowance will help you focus your mind on other things."

"Aw, *Dad!*"

"Go! And don't slam the door!"

Sam watched the door swing softly shut, then shook his head angrily. In some ways it was nice having a semi-precocious son already far more knowledgeable about computers than he was, but it was occasionally hard on his wife.

Poor Marianna! Sunny, unpretentious, and extroverted, the Brazillian-born girl was an incomparable wife, lover, and mother. Carefree and fearless, she had worked hard to become—at age thirty-seven!—the three-time New Mexico state ladies hang glider champion. But she was no intellectual, and, Sam had to admit during his dark moments, sometimes disquietingly forgetful or slow on the uptake about apparently simple things.

Was that the consequence of the brutal disruption to her memories a few years ago in Brazil, or had she always been that way? Sam had no way of knowing. Joelina Kody, Emily's partner in the clinic, had reluctantly conceded that certain parts of Marianna's mind might have been permanently affected by her ordeal at the hands of experimental brain-scrubbers. But Dr. Kody, who had known Marianna for some years before the brainscrubbing, and had then used the clinic's facilities to restore her to mental health afterwards, had a perspective that Sam didn't. Sam had hardly known Marianna before rescuing her from Belo Horizonte and didn't care what she had been like then; all he knew now was that he loved her dearly just the way she was, and wouldn't change her for anyone in the world.

Sam tapped his desk irritably. His precocious son would just have to learn to deal with all the billions of people in the world who weren't quite as smart as he thought he was.

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He glanced wistfully at the time display on his wristphone, hoping it would be late enough to pour himself a glass of Scotch. It had been a trying afternoon. No sooner had he returned from Washington than his private line from the Senate had rung: it was Senator Harcombe, chairman of the Defense Appropriations Committee.

"Sam, those sonsabitches at the Federation have done just what I told you they were going to: given us a formal order to turn over all our classified records for the last twenty years. They say, and I quote: 'Sanctions will be applied if they are not received within thirty days.'" The chairman looked at Sam grimly. "Sam, I'm personally calling everyone on the committee. We've got to think of ways we can stall them. If we don't, if we just roll over and play dead, then American sovereignty is officially dead. It's the end of the United States as a free country."

Sam nodded. "I don't know what I can do, but I'll give it my best attention, Jerry."

"Do that. I'll check back with you Monday morning. Oh, and Sam. There were a couple of Italian army generals in Rome who tried to stall them last month on something or other. Two of them were shot down last week in broad daylight in the middle of Rome. No one has been arrested. There's no proof it was the Federation, but I think it was a little warning: they're willing to play very, very rough."

As Sam pondered his conversation with the chairman he got up and poured himself a whiskey anyway. There was nothing, he reflected, as dangerous as a thwarted, self-righteous bureaucrat. He sipped his Scotch and decided that there was one positive thing to be said for the afternoon: at least Emily's husband wasn't coming for dinner.

Fully one-quarter of the people at the dinner table that evening were unabashedly cheerful. That quarter consisted of Marianna, who gave a spirited account—interspersed with snatches of song—of her adventures at a hang-gliding competition in the Sangre de Cristo Mountains near Los Alamos. Bruce glowered at his slice of veal breast and stirred his mashed potatoes angrily. Emily, Sam's daughter from his first marriage, made a few desultory attempts at conversation, then devoted herself to the food. Sam's mind was still on the Federation.

"It's a good thing it wasn't in existence when we got the O-CLIP for the clinic," he muttered to Emily. "They would probably have tried to suppress the technology even more adamantly than our own government wanted to."

Emily looked at him quizzically, apparently startled by his words. "You really think so? But why would the Federation be against O-CLIPs? We've *proved* what wonderful things they can do for the world."

"Because that's what they've been told their duty is: to keep the world from destroying itself." Sam snorted and reached for another slice of veal. "Even if they have to get down to the level of keeping children from throw-

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ing sand at each other in the kindergarten sandboxes."

Marianna looked at Sam with great brown eyes that were wide with puzzlement. "But, Sam, surely you don't want people killing each other like they did in that horrible . . . horrible. . . ."

"No," Sam muttered unhappily, "of course I don't."

Four years earlier the Khyber Holocaust between South India and Pakistan had vaporized 47 million people in three brief days of nuclear horror. An outraged world had seized the surviving leaders of both countries and hanged them publicly. The Federation had been created two years later, with headquarters in Geneva. Japan, Germany, and Brazil had publicly delivered their nuclear arsenals to the Federation; like it or not, every other nation in the world had then been forced to yield significant amounts of sovereignty to the Federation. Its charter was to prevent all future wars—by any means necessary. Two corollaries necessarily followed: The Federation would take control of and destroy all weapons of mass destruction; it would also investigate, control, and suppress any new technology that might conceivably be used in warfare.

"Now," said Sam, "they've finally got the paperwork cleared away, the bureaucrats and infrastructure are in place, and they're beginning to show their teeth. Right now they're inventorying every single weapon in the world—and anything like O-CLIP computers that might even possibly be turned into a weapon."

Marianna's marvelously expressive face registered shocked dismay. "But . . . do you really think they'd try to take *Emily's* O-CLIP away? It's already got so *many* restrictions on it. And Emily says that Linda is already such a . . . such a giant pain in the keister." She giggled happily at her flawless command of slang, then turned to scowl at Sam with mock ferocity. "And I don't want to see *you* hanging around that Linda too much, either! You can tell just to look at her that she's a busybody in more ways than one!"

Sam found himself grinning in spite of his grim mood. Linda Rawlings of the Treasury Department was young and attractive enough if you liked them scrawny, but nowhere near as beautiful as either his wife or his daughter—both of whom were within a few months of their fortieth birthdays. "No danger of hanging around too much with Linda," he smiled, "the congressional branch always keeps its hands strictly off the executive branch. Particularly us old-timers."

"Old-timer, ha!" To their son's manifest disgust, Marianna leaned across the table to kiss Sam noisily on the cheek. "You and your hands!"

Sam's grin broadened. He was sixty-two years old and as fit and active as he had been twenty years earlier. His once red hair was now little more than a vanishing wisp of gray, but even with his prosthetic left foot he regularly beat tennis players half his age. Retirement from his self-imposed but emotionally racking mission of tracking down painlusters, and then his marriage to Marianna, had

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brought a serenity and contentment he had never known before. He had moved to New Mexico from his bare apartment in Kansas City and spent the first two years of retirement handcrafting a modest house a few hundred yards from his daughter's clinic on the shores of Eagle Nest Lake. After that he felt free to devote himself to good works. In 2064, at the age of fifty-six, he had been appointed, to his vast surprise, to the United States Senate. To everyone else's surprise he was then elected on his own in 2066. To his detractors he was known as Senator Blood because of the two merciless decades he had devoted to hunting painlusters. Sam winced at the term and tried not to show the acute pain it caused him.

"I wish we didn't have any executive branch people here at *all*," said Emily fervently. "Ever! And of all of them, this Linda Rawlings has really been the most stupendous pain. Officious, overbearing, and stupid! I—" She stopped, glanced at Bruce, and finished, "I'll tell you back at the clinic."

"The clinic? Can I come too?" Bruce's eyes suddenly sparkled. He had never been allowed to touch the O-CLIP computer that was the heart of the clinic's therapeutic operations, but he spent as much time as he could cadge with the clinic's ordinary computers. "They wouldn't let me go to my camp, so I got nothing to—"

"It's off to bed for you," said Sam firmly, rising to his feet. "Tomorrow we'll have lesson number two in deportment and good citizenship—and then we'll see about camp."

* * *

The shadows in the evergreen forest that surrounded the clinic were deep and black as Sam strolled meditatively along the shores of the lake this pleasant summer evening of August, 2070. Emily too was silent; he found her hand and took it in his. As the sprawling complex of white stucco buildings that was the Sunny and Harmony Hallowell Trauma Center came into view around Gideon's Point, Sam reflected upon the startling growth it had undergone in the last fourteen years. Some of its growth, he supposed, was due to the talent of its three directors; some to its possession of one of the world's few 3-D O-CLIP computers for treatment of severely disturbed patients; and—sadly—some to the sheer number of traumatized victims left behind by the unremitting violence of the Great Sweep and its war on painlusters. Sam's eyes moved from the calm dark waters of the lake to the cool depths of the forest. Eagle Nest Lake, thirty miles north of Taos and ninety miles from Santa Fe, was the perfect setting for the sick to recover—and for tired old warriors like himself to raise a family.

Emily opened one of the many side entrances to the clinic and led Sam along an unfamiliar hallway. Three carpeted steps led down to the annex that Sam recognized as housing the clinic's most intractable patients, those whose mental disorders were so severe that without the treatment afforded by the O-CLIP computer they would be doomed to live out their lives in institutions.

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Emily greeted two passing nurses, then suddenly stopped short. Her hand tightened around Sam's elbow. "Rawlings," she whispered "There she is by the clipper room."

"Well, so what?" said Sam, regarding without pleasure the treasury agent they had been discussing earlier. She was kneeling in the corridor, her nose pressed nearly against the heavy double doors that opened into the clipper room. As Sam watched her curiously, Linda Rawlings finished her apparent scrutiny of the door and rose to her feet. She began to rattle handles.

Emily exhaled softly and threw back her shoulders. "Let's go," she said to Sam. "Ignore her."

Increasingly mystified by his daughter's behavior, Sam took her arm and led her down the corridor.

"Ah," said Rawlings in the supercilious tones that had always grated on Sam's ear, "it's Dr. Ferron-Bantry. I was just about to call to tell you that I'll be changing the access codes first thing tomorrow morning. This afternoon I distinctly saw one of the cleaning personnel trying to open this door."

"I'm sure she was just cleaning the handles."

"Perhaps, perhaps not." Rawlings sniffed loudly. "Some of us take our responsibilities more seriously than others. Would you kindly remind your staff once again that this room is *completely* off limits except to authorized personnel; that it is a federal offense even to *attempt* to enter?"

"Even for us federal-type senators?" asked Sam in faintly mocking tones, unable to keep from teasing the clinic's unwanted but indispensable official snoop.

"Even for federal-type senators, Senator Ferron," replied Rawlings coldly, her gray eyes meeting his in unwavering challenge. "Good evening." She patted a straggly brown curl into place, then turned and marched stiffly down the corridor. Sam reflected uncharitably that for a scrawny young woman who was only one missed meal from being actively gaunt, she had an overly large behind and thick ankles.

Emily made a vicious sound of disgust. "To think that *we* have to pay her salary to have her snoop on us!"

"Now, now," said Sam, trying to lighten Emily's dark mood, "you wouldn't want to force the long-suffering American taxpayer to pay her, would you?"

Emily shot him an unamused look and stalked angrily to her office.

"Well," said Sam, as he settled into the depths of an old blue sofa and accepted a mug of coffee, "what's it all about?"

Emily gestured viciously at the hallway they had just left. "That . . . that *person* is part of it," she said between clenched teeth.

Sam nodded sympathetically but felt constrained to remind Emily of the distasteful truth: without a permanent representative from the Treasury Department present, the clinic would not have been allowed to purchase its heart and brain—the O-CLIP computer.

"I know, I know, that's what makes me so upset about it all."

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"Emily, just what is the problem?"

"It's—" Emily looked down at her hands, "—it's Roderick."

"Ah." Sam's grunt was noncommittal. He was sorry that it was husband trouble after all, but jubilant that it had nothing to do with his wife's health.

"No, no, it's not *that* kind of problem." Emily slapped her desk in exasperation. "I almost wish he *did* have a human mistress! At least it'd keep him out of other kinds of trouble. This is worse."

Four years earlier, Roderick Bantry was an ambitious associate professor of subatomic physics at the University of New Mexico who had been beginning to despair of ever achieving tenure. Dark, muscular, and ruggedly handsome, he was seven or eight years younger than Emily. They had met at a colloquium in which Emily had been invited to talk about her work with the 3-D O-CLIP computer. At the time, Emily was still depressed by the death of her husband in a plane crash while filming a documentary in Chinese Siberia. For three years she had avoided romantic involvements, throwing herself instead into her work and in her spare moments becoming something of a second mother to Bruce. Six months after their initial meeting, Emily and Roderick were married.

Roderick's doctorate in subatomic physics from the University of Minnesota had concerned the properties of gravitons, the elusive but basic wave-particles that transfer the force of gravity. After the final closing of the government laboratories at Los Alamos in the 2030s, many of the personnel had remained in Santa Fe to take positions with the University of New Mexico. Roderick had joined the faculty as a theoretician but almost immediately had displayed a previously unsuspected knack for the design and construction of ever smaller, ever more sensitive graviton readers. An imperious chairman smarting under budgetary constraints had designated Roderick the department's head of design. Nationwide, there was little demand for doctors of subatomic physics; Roderick gritted his teeth and accepted the informal assignment. Thereafter, except for a few hours of teaching duties, he spent most of his time building hardware for other scientists to use, inwardly chafing at what he considered as little more than a mechanic's role. He kept only a studio apartment in Santa Fe and every Thursday or Friday made the long commute north to Eagle Nest Lake for a three- or four-day weekend with his wife.

Emily had always known that Roderick was interested in the functioning of the clinic's O-CLIP computer, but it was not until they had been married for eight months that he jocularly made his first request to be allowed to use it. It would, he said, be invaluable in his own private research project. Emily had laughed in turn and once again explained the federally mandated constraints under which it operated.

The soul of the clinic's computer was a massively parallel, 3-dimensional Optical Cell Lattice Image

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Processor that performed functions similar to those of a human brain, but millions of times more quickly. The O-CLIP was a neural-net processor whose operations worked entirely through light, with little or no electricity involved in its internal workings. The so-called neural net was composed of junctions of information points linked to each other in a variety of pathways. These junctions were the equivalent of a human brain's synapses. Aside from the neural-net computer's sheer speed, what made it so revolutionary—and so dangerous from the government's point of view—was that it could be taught to mimic human learning processes.

In order to "teach" an O-CLIP computer, it was first given carefully configured data and was then told what the resulting output should be. This process was repeated several times, with different input entered and different results required. Using both positive and negative feedback, the O-CLIP ran the data through a myriad of different synapses, constantly weighing the nature of the input until it had succeeded in generating entirely by itself the required output. This process established certain paths and methods of "thinking." New data could now be introduced for which the output was *not* given; the O-CLIP had to generate its own output—and did.

The answers were not always what its human tutors had expected.

Because the O-CLIPs—particularly the 3-dimensional models—could work so much more creatively than ordinary computers, and so much faster than human brains, they were reluctantly but immediately recognized as being theoretically hundreds of times more "intelligent" than any human being could ever dream of being. . . .

A few years before Emily established her clinic, the United States Government had begun secret research with 3-D O-CLIP computers using the same perceptualization enhancement process by which suspected criminals were interrogated. It was soon evident that the worst fears of civil libertarians had been realized: taken together, the two techniques produced a machine that not only read minds like perceptualization enhancement interrogation, but that could also scrub a human brain of its previous memories and replace them with a complete set of false memories.

The research had been reluctantly halted and the sale of 3-D O-CLIPs forbidden. There were, however, legitimate medical uses to which the machines could be put. Political pressure had been brought to bear and eventually the restrictions on the O-CLIPs were lifted just enough to permit their installation in a few carefully monitored medical centers. Emily's was one. But no one except Emily, a handful of her co-workers, and the clinic's patients were allowed into the sacrosanct presence of the computer.

In June of 2069 it became clear to Roderick that the theoretical work he was doing in Santa Fe had reached an impasse. Throughout the long, frus-

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trating years in which he labored as a hardware designer, Roderick had spent his spare time designing an elegant experiment in the form of a computer simulation that would, he was certain, establish him as the world's leading graviton theoretician.

The meticulously programmed simulation had, however, when run through the laboratory's computer, yielded unexpected results that could in no way be reconciled with established theory—at least not in the way Roderick had so eagerly anticipated.

Roderick looked at his screen in dismay. Was there another particle at work, some subtle force he had ignored? Was the input data itself inaccurate? He groaned in anguish as he saw four long years of work going to waste. If he could explain what had happened and at least reconcile it to established theory, then he might yet salvage something from his years of effort, even if he hadn't accomplished what he had originally set out to do. But to do so, he needed both a new way of evaluating the present data, and, if it could be shown to be flawed, a new means of configuring it.

It was instantly obvious that the O-CLIP computer that had first drawn his attention to Emily—and that had always been so tantalizingly out of reach—was a possible means of salvation. If only he could use it to review his data.

Two years after their marriage, Roderick pleaded with Emily to at least grant him access to the machine. If only he could input data from earlier graviton experiments that were known to be 100 percent reliable, he said, he could adjust the O-CLIP to give an output identical to the 3-dimensional color plots that were currently accepted as standard models. Then, he argued, he could enter his own data and the resulting output might give him the answer to what was obstructing his own work. Without the O-CLIP, he said, his career lay in shambles.

For ten agonizing days Emily considered the request from every possible angle. Finally, with tears in her eyes, she had been forced to refuse. It was simply too dangerous, she said, imploring his understanding. If ever he were caught using the machine, the clinic would lose its computer—and Roderick would go to a federal prison. Roderick stormed, wept, shouted, begged, and cajoled, to no avail. Eventually he returned to Santa Fe and Emily returned to her patients. He never mentioned the matter again.

Weeks passed, months, a year. To Emily's joy, Roderick was spending longer and longer weekends at Eagle Nest Lake, burying himself until the small hours of the morning in the office she had found for him on the far side of the clinic. In spite of his self-imposed workload he was a loving and attentive husband. Emily threw her arms around him and felt occasional pangs of guilt about denying him the use of the clinic's computer.

Unbeknownst to Emily, her husband had spent the last eight months using his considerable intellect to methodically garner all the information needed to circumvent the elabo-

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rate precautions that kept unauthorized personnel from using the O-CLIP computer. Access codes, restrictions on the power supply, automated spy circuits, passwords and locks, one by one they were located. One by one he devised a means of thwarting or bypassing them.

Roderick had always had a fairly clear idea of how to operate the machine; finally he took the ultimate step: late one night in April, 2070, he slipped unseen into the clipper room and crouched tensely on the seat in front of the O-CLIP computer. He touched the keyboard with a tentative finger. Two weeks later he was as familiar with its operation as he was with his own personal computer.

In early May, Roderick Bantry began to input fifty years of data covering the entire fields of subatomic physics and quantum mechanics. Everything he could pull from the university's library and databases that related to gravitons and other force-carrying particles was methodically entered over a two-month period. Another two weeks of clandestine visits to the clipper room and he had entered hundreds of three-dimensional color illustrations of what physicists thought subatomic events would look like if the human eye could somehow observe them. Finally he input his own equations and data. In spite of its enormous power, he knew that the O-CLIP would take several minutes to create the first original picture constructed from Roderick's data.

The picture that took shape on the monitor was unexpected in the extreme: it was a wobbly, black and white, distorted mass of shapes and blurs that looked like nothing at all—except for one small section that vaguely resembled the dial of a laboratory test instrument in the same way that a Dali painting resembled the photograph of stem-winder watch.

Roderick stared at the ill-defined image of the half-melted dial for several long minutes, his heart pounding in his chest. What the picture actually meant was at the moment relatively unimportant; the essential thing was that some of the greatest scientific discoveries in history had come about by sheer accident. Was this the accident that would make Roderick Bantry famous?

Using the image correction software that was an essential part of the O-CLIP teaching environment, Roderick redrew the dial and the area immediately surrounding it to more closely match what an authentic dial should look like. He then ordered the machine to accept this changed picture as part of its learning routine and to redraw the entire picture.

Four minutes later Roderick's arms were covered with goose bumps as he looked at the subsequent picture. The dial was now accurately rendered—and just to the left of it was a long jagged scratch that he remembered seeing beside the amperage readout of the Santa Fe laboratory's main graviton reader. With trembling fingers Roderick buried the results of the evening's work deep in the innards of the machine's memory and went off to bed. He spent a sleepless

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night. A single phrase ran through his mind for hour after hour: graviton camera, graviton camera, graviton camera. . . .

Three days later Roderick returned from Santa Fe with a detailed set of photographs he had taken of the university laboratory. Using the first of the photographs, he sketched in the four dials closest to the amperage dial the O-CLIP computer was already displaying. Once again the machine was instructed to learn from the change and to redraw the picture.

The process continued for the rest of the week. At the end of that time Roderick could pan the monitor across a perfect picture of the entire laboratory in which he had collected the data that now resided inside the O-CLIP computer. For the moment, what he was seeing made very little sense, but Roderick knew that eventually the mystery would be unraveled. One thing, however, was clear: the O-CLIP computer was somehow using information that related exclusively to subatomic particles to generate a monochrome photograph of the laboratory itself. And that picture could be altered. Each time that he input a new set of data from his graviton reader in Santa Fe, the monitor showed slight changes either in the corresponding instruments on the screen or in the laboratory itself. Sometimes a chair might be in a different position; on one eerie occasion there was a clear picture of himself bending over an instrument panel.

Roderick Bantry took a deep breath and then a long look at himself in a mirror on the far side of the clipper room—as if measuring himself for the suit of clothes he would wear to the Nobel ceremonies in Stockholm?

But why not? he answered. He really *had* discovered the graviton camera.

Now only one thing stood between him and the Nobel: a plausible explanation of how it worked.

The following day, a Saturday, Roderick returned to his deserted laboratory in Santa Fe in order to take a complete set of readings from every instrument in the room. In his hurry to begin collecting data, he brushed against a colleague's work table and knocked a small optical scanner to the floor. Roderick cursed—it was clearly broken. Shrugging angrily, he went down to the basement storeroom and replaced it with a somewhat larger, outdated model that had been discarded some months before. He spent the rest of the afternoon collecting his readings, paying particular attention to the various graviton readers, then returned to his car for the long drive back to Taos and Eagle Nest Lake.

That evening, as soon as Emily was sleeping, he made his way cautiously to the clipper room and began to input the new readings from his Santa Fe instruments. Three minutes later a picture of the laboratory began to emerge. He looked at it with no immediate sense of disappointment; although nothing appeared to have changed from the picture he had generated the night before, sometimes the changes in the laboratory were subtle: he would now have to zoom in on the actual readings on the dials.

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He began to pan the monitor slowly across the room, gradually enlarging the image of the nearest of the graviton readers.

Suddenly he stopped, then refocused the picture. Yes! The optical scanner there on old Hamilton's table was clearly not the replacement he had brought up from the storeroom but the one he had broken as soon as he entered the room.

The scanner that he had broken *before* beginning to take his data readings.

The scanner that he could now only be seeing if . . . if. . . .

Roderick fell back in his chair, his thoughts whirling.

. . . If somehow, instead of merely discovering a graviton camera, he had somehow discovered a graviton *time* camera. . . .

"What's a graviton?" muttered Sam in the long silence that followed. "I'm sure I knew back in the days when I was the editor of that skeptic's magazine, but now. . . ."

Emily shrugged helplessly. "*I* don't know, only what the dictionary says: for many years a purely hypothetical subatomic particle, its existence finally proven by Winken, Blinken, and Nod in the year two thousand ought something or other. It has an indefinitely long lifetime, zero electric charge, and zero rest mass."

"Hrmph. And what does that *mean?*"

Emily shrugged again. "Just as there's no light without photons, I guess that there's no gravity without gravitons."

"And he's certain that it's a *time* machine?"

"Not a time *machine*; a time camera, or a time scanner. All it does is *show* you the past; you can't use it to affect anything that's already happened."

"Hrmph." Sam looked up at the ceiling. "Are you *sure* he's not somehow mistaken?"

"Absolutely. Once he got the idea that it might be a time scanner, he bought a big, battery-powered clock with a lighted, twenty-four hour day and date display. He took it to the lab and set it next to the dials of the main power supply. Then he went away for twenty-four hours.

"When he went back to the lab he set up a recorder to record himself collecting a new set of readings."

"Why a recorder?"

"So that he could *prove* exactly when he had collected the data and what time the clock was showing as he did it. Then he drove back here and as soon as it was safe entered all the new data into the O-CLIP."

Sam held up his hand. Finally he said slowly: "All the new data, which, in theory, if it was just a graviton *camera* he was dealing with, would show the clock's time as being what it was while he was collecting the data?"

Emily nodded. "Exactly. But when the picture formed, it showed the time on the clock as being three hours and seven minutes *before* he collected the data. And he himself wasn't anywhere in the picture, but the *janitor* was, somewhere off in a corner. So . . ." Emily spread her hands in a gesture of helplessness.

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"So we've got a genuine time scanner. And Roderick's got a Nobel to put up on the mantel." Sam leaned forward. "So what's the problem?"

Emily looked at her father wide-eyed. "You don't *see?* If anyone discovers he's been using the O-CLIP he'll go to *jail!* And the center will lose its O-CLIP! I know that may sound selfish of me, but it's something we *have* to think about. Without the O-CLIP, we might as well shut the clinic down! And—and—" Emily looked down at her clenched fists "—it's just not *fair!* It's like he's been *cheating* on me, sneaking around my back to—"

Sam struggled to his feet from the low couch and patted Emily awkwardly on the back. "Oh, come on, honey, that's—"

"No, it's true! It's as if he only married me just in order to use my *O-CLIP!* Maybe that's not really true, but that's the way it seems! It hurts, Sam, it hurts."

Sam looked down at his daughter in dismay. There were tears in her eyes. In spite of her three medical degrees in neuropsychological therapy, to him she would always be the little eight-year-old child he had to cuddle and protect.

Sam sighed. Emily and Roderick *had* spent three reasonably happy years together. And Roderick was far from being an actual ogre.

"Look, honey," he said, "what you said is absolutely right: he shouldn't have gone around your back like that. It was dangerous and foolish and selfish, but now it's done, he wasn't caught doing it, and now it's the Nobel prize for sure. So why don't you just try to for—"

"Forget it all?" Emily looked up, her face drawn. "But that's just the problem, Sam, we *can't* just forget it all! Don't you see? He's tried duplicating the time scanning effect with other computers: it just doesn't work! Not even on the most powerful computers at the university! He's just getting into this aspect of it, but it's already perfectly clear that you need two things in order to create the time scanner effect: a graviton reader and a three-dimensional O-CLIP computer. Without the O-CLIP, a graviton reader is just a hunk of machinery for counting gravitons."

"Hmmm, that *is* a prob—"

"It's *two* problems," said Emily testily. "One: he can't even write a preliminary paper about his discovery without admitting that he had illegal access to a restricted machine. And two: without using the O-CLIP he can't make any further progress at all. You keep talking about the Nobel, just the way he does," she said bitterly, "but to get the Nobel he's going to have to explain how it worked, and in order to figure out how it works he's going—"

"—To have to keep using the O-CLIP here at the center. And take the risk of being thrown into jail and shutting down your clinic." Sam fell back into the sofa and tugged at his chin. "By the way, how did you discover all this?"

"Pure happenstance. I'd gotten an emergency call to see a patient at four in the morning and he was just coming out of the clipper room. He'd set

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up an absolutely undetectable spy-eye to tell him if the corridor was clear—and then forgot to check it before opening the door, the idiot! He walked right into me. Both of us nearly had heart attacks. He pulled me inside the clipper room and told me everything, showed me how the scanner worked—"

"You've actually *seen* it?"

"And it really does work," said Emily harshly. "Would you like to see it? I can sneak you in and show you, and then we can *all* go to jail if that Rawlings person catches—"

"Easy, honey, easy. I don't need to see it now. Maybe later. But isn't that the answer to your problems, at least for the moment? Didn't we just hear Rawlings say she was going to change the access codes tomorrow morning? That means Roderick won't be able to—"

"Oh, pooh! She's changed them twice a month for the last year now and Roderick goes through them like they were cobwebs. I tell you, Sam, he is *determined. Nothing* is going to keep him from that O-CLIP and the Nobel prize for physics."

"Hmmm. Except Rawlings, maybe. Suppose *she* walks into him coming out of the clipper room some night?"

"That's just what *I* said! And do you know what Roderick said? He said not to worry, that Rawlings spends all her time with a clip-clop band in Taos smoking tobacco and groping deebees and that if she ever caught him he would blackmail her into keeping her mouth shut. I tell you, Sam, the man's obsessed!"

* * *

Three warm summer weeks passed before Sam was given a demonstration of the time scanner by Roderick Bantry himself. During that time he shuttled back and forth to Washington. He and the senate defense committee of which he was a very junior member stalled, delayed, temporized, and evaded but were being relentlessly pressured by the Federation to deliver the records that would someday help the bureaucrats in Geneva effectively disarm the United States of America. Along with the rest of the committee, he listened to a Monsieur Rémo Lenclud of the Office of Planetary Security lecture them about the dangers of unsupervised technological advance. "Who would have thought when Robert Goddard made his first successful launch of a liquid-fuel rocket weighing no more than a few kilograms that someday the entire world would be held hostage to the threat of missiles armed with nuclear warheads capable of destroying entire continents?"

"Anybody who'd ever read Jules Verne or H.G. Wells," muttered Sam grumpily, but his thoughts had wandered away from the committee room to the clipper room in northern New Mexico. The greatest danger to Emily's husband, Sam had thought ever since first learning of the scanner's existence, lay not with the Treasury Department and the risk of federal prison, but with the Federation and its reaction to such an obviously revolutionary discovery. And it was clear in listening to Monsieur Lenclud that breakthroughs like Bantry's were precisely what the security divi-

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sion of the Federation had been given orders to find—and to suppress at any cost.

Sam cracked his knuckles noisily into a momentary stillness that had fallen over the committee room. Be careful, Roderick my boy, he thought, there's many a slip 'twixt cup and Nobel.

"And if they don't try to out-and-out suppress it," he said three nights later, "then at the very least they'll try to take it away from any further experimentation by Roderick."

"But *why?*" called Marianna from the kitchen. "It sounds to me like it would be a *wonderful* thing to have! So much fun to see what Christopher Columbus *really* looked like. Or Jesus Christ. Or the Wright Brothers or the Beatles or—"

Sam grunted skeptically. He and Emily were sprawled in the living room sipping wine while Marianna put the finishing touches on the strawberry shortcake. "You think there's any politician in Geneva, or in Washington, for that matter, who would relish the idea of Roderick Bantry being able to take a photograph of him receiving a cash bribe under a restaurant table—or of him checking into a hot-sheet motel with two underaged call girls?"

"Oh. I hadn't thought of *that*."

"You can bet that everyone else in the world, politician or not, who's ever done anything dishonest or disreputable even once in their lives, will think of it the moment that he or she hears of its existence."

"But *I* didn't!"

"That's because you're you, and a more wonderful, more innocent you doesn't exist in the whole world."

Marianna's laugh was like tinkling bells. "Oh, Sam! I'm really such a wicked, horrible creature, if you only knew! Now come and eat your dessert, both of you. And where did Bruce get to? Bruce! Come get your shortcake!"

Bruce jumped to his feet from behind the couch and dashed to the dining room, his computer pad still in his hand. Sam looked at him in surprise—he had thought that Bruce had gone up to his bedroom to play with his main computer. Could he have been paying attention to what they were talking about? Sam shrugged. Bruce was hardly about to inform Linda Rawlings of Roderick's clandestine activities in the clipper room.

But now Sam was obliged to confront the main problem head on. He stood in front of the clipper room's primary monitor, scrutinizing the black and white image of what was clearly Emily's spare bedroom. Soon after her marriage to Roderick it had been converted into a study of sorts with bookshelves and a small desk. Sam could see someone sitting at the desk.

"That's me you're seeing," said his son-in-law without looking up from the controls of the O-CLIP computer, "at about 7:30 yesterday evening. That thing you can see a corner of just beyond the bed is the graviton reader. That's the one I brought up to keep at the lake after I figured out that whatever we see on the screen is totally dependent on the data we

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take from the reader."

"I didn't know they were that small," muttered Sam. "I've been reading up about them in—"

"You're looking at the smallest one in the world," interrupted Bantry impatiently. "Designed and built by me especially for this . . . well, whatever you want to call it. Investigation, I suppose."

Sam sighed and stepped back from the monitor, his eyes turning to Emily, who stood tight-lipped and rigid on the far side of the room. Her face was unyielding. She nodded urgently. Well, Sam thought, I *did* promise her I'd handle the dirty work. . . . "So how much longer will this . . . investigation go on?" he said. "I really hate to carp about this, Roderick, because I *do* recognize the importance of what you're doing. But it won't do any of us any good if we all end up in the federal pen. I'm sure you're under a good deal of tension here, having to sneak in and out as you do, but so is Emily, and for good reason. You've got to understand that whatever the importance of your research, you can't continue to jeopardize her clinic for an indefinite period of time. Three weeks ago you told us that if we gave you another month you'd be able to wrap things up. That leaves you about ten days. How about it, Roderick: are you going to be out of here in ten days or not?"

Bantry swung around in his chair, his face haggard. His eyes were red-rimmed and he had noticeably lost weight. Sam felt both sorry for him and exasperated with the man: why couldn't Emily have married a normal run-of-the-mill simpleton like a lawyer or a stockbroker instead of an obsessed scientist?

"I don't know," said Bantry finally, running a hand through his dark, curly hair. "You simply can't make science work on a nine-to-five basis: either you discover things or you don't. What I've discovered so far is almost enough to write up: the scanner is 100 percent dependent for the picture it generates on input from a graviton reader. The reader itself can be anywhere at all, here, Santa Fe, or the other side of the world, just as long as you can access its data. But the picture that the O-CLIP produces is *always* a function of the physical location where the reader is at the time the data was taken. Right now we're looking at a picture of our study. If I moved the reader out to the garage—and I could, it's reasonably portable—then we'd be looking at a picture of the garage."

"And about thirty-six hours in the past?" asked Sam.

"Yes. I've played around with the data and the O-CLIP settings, and I've managed to push its range back to about thirty-six hours. I think that in order to go beyond that we're going to need more power, just where I'm not certain, either in the O-CLIP or in the reader. Or perhaps more accurate graviton data. And then if I could get continuous input from a reader into the O-CLIP, I think we could have a motion picture up on the monitor. Then it would be like having a two-dimensional black and white television that looked into the past."

Sam glanced again at the image on

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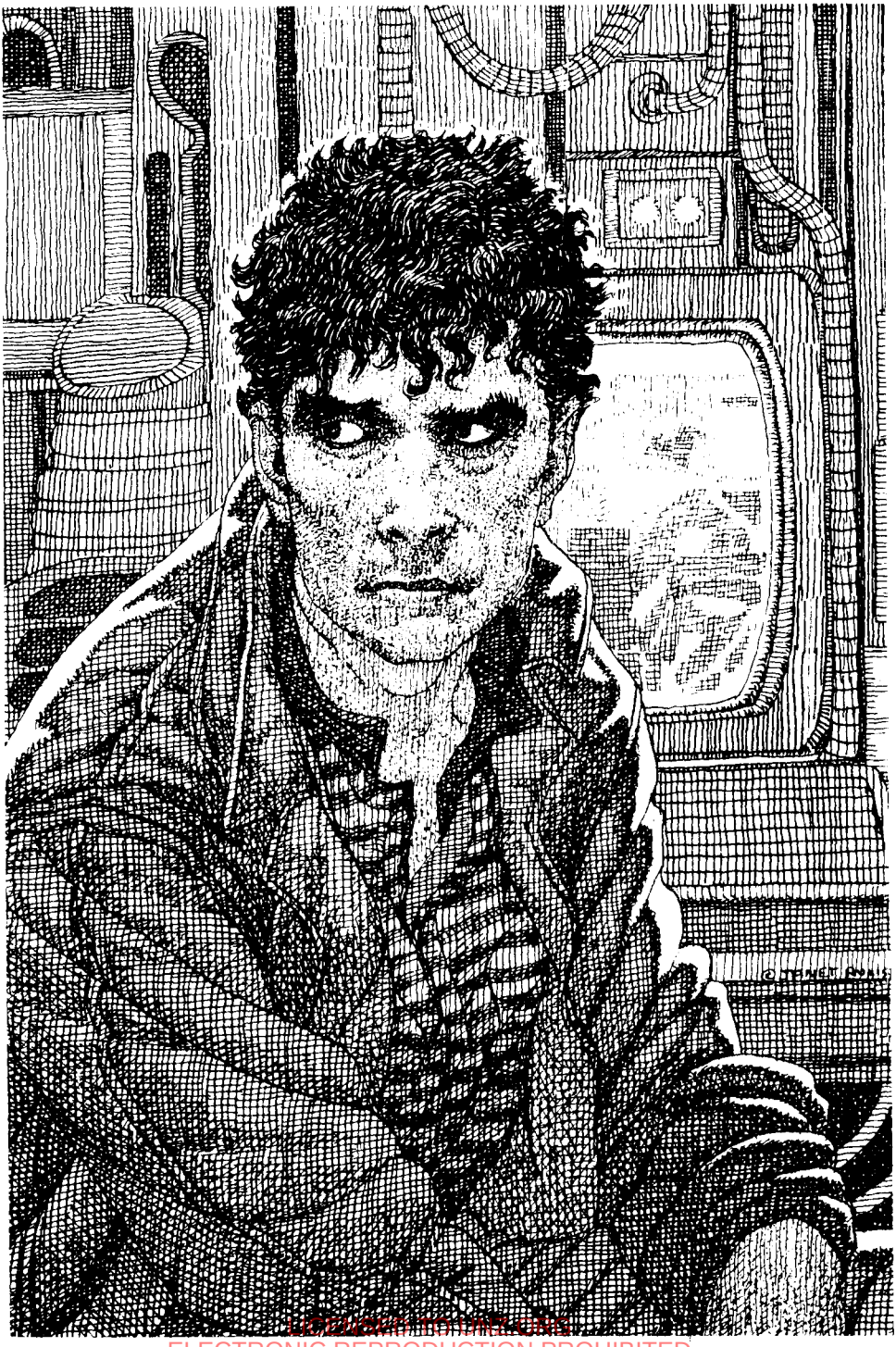

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the monitor, then at his daughter. She seemed unimpressed by the magnitude of her husband's discovery. "But you're no closer to an explanation of how this scanner actually *works* than you were three weeks ago?"

"I—"

Sam laid a hand gently on Bantry's shoulder. "Roderick," he said softly, "it was years before people fully understood exactly how X-rays worked. But Röntgen would have gotten the Nobel prize anyway—just for discovering them and systematizing the research without doing any theorizing at all. At some point you're going to have to do the same. We'll figure out a way to get some institution that can't be pushed around by the Treasury Department—like Oxford University or International Chemical Corp. or Apple-IBM—to sponsor your work, or to shelter you, and you'll go public without mentioning the O-CLIP here. But it's got to be *soon*, Roderick. Both you and Emily are nervous wrecks, and you look it. I'll give you ten more days here in the clipper room and after that it's finished, whatever the consequences."

Bantry looked up, his eyes wide in disbelief. "You'd tell—"

"I don't know what I'll do, but one way or another I'll shut down this operation. I'd hate to do it, Roderick, but believe me, I will."

Sam was in Senator Harcombe's private office at the Capitol, with a glass of bourbon in his hand and the latest threats from the Federation in his thoughts, when the emergency override of his wristphone rang softly. He looked at it in dismay, then raised it to his ear with an apologetic shrug for the chairman. *No* one was supposed to call him on it during working hours—except in the case of disaster.

"Yes?"

"Sam! It's Bruce—he isn't here!" Marianna's voice was frantic. "I haven't seen him since just after dinner last night! He—"

"Wait a second. It's 5:35 here, 3:35 there, right?"

"Right. He went up to his room right after dinner and I haven't seen him since. When he didn't come down this morning for breakfast I thought he'd gone out on the lake, but then when he didn't come back for lunch, I called everyone we know but no one's—"

"You've tried calling him on his phone?"

"Of course I have! And there's no answer. Not even when I use the override! That's what worries me, Sam. His phone isn't broken, but it doesn't answer!"

"Damn! Maybe he left it in his tree house or . . . Marianne, was his bed slept in?"

"No! And that's what—"

"Now look, Marianna, don't panic. But I want you to hang up for just a moment, I'll try calling him myself. I'll call you right back."

Two minutes later Sam was back on the phone with Marianna. "He didn't answer me, either. I . . . I think you'd better call the police, honey. Tell them about the tree house, that it's somewhere on the other side of the lake, but we don't know exactly

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where, it's always been his big secret. I'll talk to the federal people here, the FBI, and see if they want to step in. I'll be out as soon as I can get there. Try not to worry. Love you."

Sam climbed to his feet, his left ankle throbbing painfully where it joined his prosthetic foot. "My son's missing, Jerry," he said, "I've got to go." He started toward the door, then turned back. "You don't suppose the Federation has . . . has started taking *hostages*, do you?"

Sam arrived at Eagle Nest Lake at two in the morning and was met on the steps of the clinic by a tearful Marianna and a haggard Emily. A weary policeman repeated what Marianna had already told him by wrist-phone during his flight west: that they were searching the woods on both sides of the lake and that the Ferrons's small canoe was missing from its rack on the shore and had not yet been located. What was new was that the last person to see Bruce was a nurse at the clinic who remembered him standing just outside the door of the clipper room late the evening before.

"The clipper room," muttered Sam in dismay, "what would he—"

"Well, he isn't in there now," said the policeman, "and there's nothing to show that he ever was there. We had a helluva fight with some damn woman from Washington, but we finally got in to search it. And just for luck we searched the whole damn clinic—not a trace of him." He yawned prodigiously. "But tomorrow we've got tracker dogs coming up from Santa Fe. Don't you worry, Senator, we'll find him all right."

Unless his son was already at the bottom of the lake, thought Sam grimly as he watched the policeman walk away. Or really *had* been kidnapped—by the Federation, or some of the few remaining lunatics who still dared to challenge police forces armed with perceptualization enhancement. But the canoe was unsinkable and still hadn't been found, that seemed to indicate that—

"This may be awfully stupid of me," said Marianna hesitantly, "but I don't see why we can't ask Roderick to use his machine to tell us where Bruce is. Didn't you say that's what it does, look back into the past?"

Sam turned to his wife feeling numb and useless. Why hadn't *he* thought of such a simple—

"That's a great idea," said Emily, "it really is, but Roderick is at a convention of subatomic physicists in Ottawa. He left this morning."

"What!" exclaimed Sam. "You mean he left with only four more days remaining on—"

"I think he's really desperate. He thinks he might be able to sound some of them out about different ways of approaching the problem without actually telling them what he—"

"But *you* can do it," Marianna interrupted, taking Emily by the arms and pulling her close. "I *know* you can—I heard you saying that Roderick showed you how he worked it."

"I . . . I . . ." Emily stood looking out into the darkness. "I suppose I could . . . at least try. But first we've got to get into the clipper room. I

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don't know if that awful Rawlings has changed the codes again or not. And there are all those other things that Roderick had to circumvent."

"If Rawlings tries to get in our way, I . . . I'll *shoot* her," said Marianna.

As he turned and pulled open the door to the clinic, Sam knew beyond a doubt that his wife was absolutely serious.

"I really don't know what we're going to see," said Emily as her fingers moved over the controls of the O-CLIP computer. "I think Roderick said a few days ago—the two of us aren't actually talking much to each other these days—that he'd moved the graviton reader out of the study and into his office here at the clinic, which actually is practically next door to us here in the clipper room, even if you have to get to it from the side entrance. I think it's locked up in his closet there. He said he's been working on ways to get a little more range by . . . ah, here's something starting to come up on the screen now. . . . "

Sam recognized the image immediately: it was the same clipper room in which they now stood, as seen from the room's far right-hand corner. A hospital bed had been rolled in and four doctors stood around it studying the patient with varying degrees of gravity. "That's this morning," said Emily after a moment, "the second or third patient of the day. I remember that we were—" her fingers continued to work at the controls "—ah, look at *this!*"

The frozen image on the screen suddenly lurched into a kind of herky-jerky motion, as if the picture was changing every half-second or so. "He must have figured out a way to input continuous data from the graviton reader," murmured Sam as he strained to watch the blurry picture of doctors moving back and forth. He squeezed Marianna against him tightly.

"Yes, it looks like he did," agreed Emily as she moved the picture across the clipper room until they had a close-up image of Dr. Joelina Kody sitting at the controls of the computer and studying the same monitor they were now looking at. "All right, we've established that the time is definitely this morning. Now let's see if we can move it back in time somehow. First we'll set it back to snapshot mode, then I think the time scale ought to be a function of this . . . and maybe this. . . ."

Little by little, Emily took the scanner back through the routine events of that morning—a morning that now seemed to Sam as distant as if it had been in some previous lifetime. Then suddenly, without warning, the monitor lost its picture and went dark. "What—"

"Wait," said Emily, holding up a hand, "let's not panic. We've been going back in increments of fifteen minutes or so. Probably the screen simply went blank because the lights were turned off in the room—which would mean that we're back to last night. I'll just keep going back until we see something again. After that we'll see if we can move outside to the corridor where Wendy saw

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Bruce."

What they eventually saw was Roderick Bantry slumped in the same chair in which Emily was now sitting. He was staring blankly at the floor and even in the harsh gray picture of the scanner his face was gaunt with despair. "He must have come in late last night some time," muttered Sam. "He sure doesn't look very happy."

Emily jumped the scanner back another quarter hour. Her husband was slumped in very nearly the same position. She shook her head and returned to the controls.

Marianna gasped as the next picture took form. "Bruce! But that's *Bruce!*"

Bruce was sitting in front of the same machine they were now using, his fingers frozen over the controls. Sam gaped at the monitor open-mouthed. It was obvious that on his own monitor Bruce was looking at a semi-clothed couple making love on top of a desk. To his even greater shock and dismay, it was also obvious that the couple was Roderick Bantry and the woman from the Treasury Department, Linda Rawlings. The desk looked as if it might be the one in Roderick's office here in the clinic.

In the petrified silence that ensued Emily finally uttered a stifled cry of pain and rage and jabbed angrily at the keyboard.

The picture lurched into grotesque motion. Bruce's head bobbed back and forth; the figures in the picture within a picture bounced and bucked. "Stop!" cried Marianna, "I don't want to see—"

A man's broad back appeared on the left of the screen and rapidly moved toward the hunched-over figure of Bruce. "No! That's—"

Roderick Bantry jerked the boy away from the computer, and, as effortlessly as if he were discarding a candy wrapper, threw him across the room. Sam saw his son's wristphone fly from his arm and disappear from sight. Sam pulled Marianna against him and held her tightly while Emily manipulated the scanner so that they saw Bantry, his face contorted with rage, marching purposefully toward the prostrate boy. Marianna struggled to break free from Sam's grip. "Let me *go!* I'll—"

"Wait, Marianna, wait! We'll—"

Bruce scrambled to his feet and, eyes round with fear, dashed across the clipper room and disappeared from sight. Emily frantically moved the picture after him, finally revealing an open door and a portion of the clinic's hallway. Bantry rushed into the picture, hesitated in front of the open door, then slammed it shut. Walking like an automaton, he staggered back to the computer and collapsed into his chair in unmistakable anguish.

Sam ground his teeth in fury. Bantry was obviously terrified that Emily would learn from Bruce about his affair with Linda. And that she would then instantly deny him any further access to the O-CLIP, no matter what the consequences might be. When Bantry saw Bruce go running through the door, he was watching his chances for the Nobel prize go with him.

"Sam, do . . . do you. . . ." Marian-

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na's voice was little more than a whisper.

"Do I think he might have done . . . something to hurt Bruce?" Sam took a deep breath and turned his eyes to the despairing face on the screen before him. "No. If he was going to do anything, he would have done it then, when he found him look—" He broke off to glance at his daughter, who sat stone-faced in front of the monitor. "How on *earth* do you suppose Bruce got in to—"

"Oh, Sam, he's so *smart* with those computers! He . . . he must have heard us talking, figured out how to . . . you *know* how much he wanted to use this . . . this. . . ." As Marianna dissolved in tears, she buried her face against his shoulder. "Find him, Sam, find him!"

"Emily?" Sam spoke tentatively, half-fearing her response.

"Yes?"

"Can . . . can you do anything more about . . . Bruce?"

Her back grew, if anything, even more rigid. But her voice was unwavering. "I'll do what I can."

Forty minutes later she had succeeded only in following Bruce a dozen steps along the corridor in the direction of the main reception room. "That seems to be the limit of its physical range," she said wearily. "Maybe Roderick knows how to extend the range, but I can't seem to. If you want, we could go back in time to see how he got into—"

"Right now that's of no importance." Sam took a deep breath. He hated to ask her, but— "Take it back to where Roderick was sitting in the chair after Bruce ran away. Let's see exactly what he does then."

Bantry did nothing more than sit in his chair looking thoroughly miserable. Finally they watched him climb to his feet and half-stumble over Bruce's wristphone. He looked at it blankly, then stuffed it in his pocket, and shuffled over to the door of the clipper room. A moment later the screen went dark.

"Lights out," said Sam, glancing at his wristphone. "And lights out for us too. It's almost 4:30. Emily, can you get us out of here without leaving any trace of us having been here?"

"I'll try."

"But what about Bru—" Marianna looked at him with imploring eyes.

Sam squeezed her shoulder. "We'll talk about that as soon as we're out of here. Right now we'd better make certain we're not caught by . . . not caught."

It was 7:46 in the morning Ottawa time when Sam called Roderick Bantry by wristphone. "Roderick," he said in a voice that he struggled to keep calm and that to his own ears sounded thick and hesitant—he had now been without sleep for nearly twenty-two hours. "We've got something of an emergency here; we'd appreciate it if you could come back as soon as possible to give us a hand."

Sam could hear Bantry yawning. "Sorry, Sam, but I'm absolutely tied up here for the next day or so. I ought to be back by Friday night at the latest."

"That's too late. We need you now, just as soon as you can get on the first plane to Albuquerque."

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"Sam, I just can't do it. Thursday or Friday at the very—"

Sam could feel his fists clenching. "Roderick. It's about *Bruce*. He's been missing for more than twenty-four hours now. He was last seen outside the clipper room. I think you understand what I mean. We need you to—"

"I told you, I can't *make* it! I'm sorry about Bruce but—"

"You mean that you absolutely refuse to help find my—"

"What do you think I can do to help—"

"The scanner, Roderick, the scanner. You can—"

"Impossible. Absolutely impossible! I've got a meeting scheduled for tomorrow morning with DeGroot and Hoffing and—"

"Roderick." Sam's voice was glacial. "One last chance: yes or no?"

"No, damn you, no! I just *can't* leave my—"

"Very well," Sam interrupted. "That's the last you'll ever see of the O-CLIP computer. The locks will be changed as soon as I hang up. And I'll hire private guards to stand in front of the door on a twenty-four hour basis. Your graviton reader is on private property at the clinic. We'll have the room sealed until you and the university can settle its ownership—and as a senator from the state of New Mexico, I automatically sit as one of the university regents. And finally, Roderick, the police will be told that we suspect you of kidnapping and murder."

There was a long silence. Then: "I'll be there this afternoon."

Sam broke the connection and stood looking down at his wrist-phone. His hands were shaking violently. He had gotten what he wanted. Why didn't he feel pleased with himself?

Bantry arrived at a few minutes after five that afternoon. Sam tried to read his face. Did he see contrition, fear, or defiance? It was impossible to tell: the man looked ghastly.

Bantry's hollow-eyed gaze took in the three people who confronted him in Emily's office: Emily, Sam, and Marianna. No one moved to greet him. "I'm sorry to hear about Bruce," he muttered at last. "There's still no word?"

"They found the canoe a little while ago at the north end of the lake," said Sam, "At Jenkin's Beach, pulled up with all the other canoes in front of the café. No one thought of looking there until now: it's miles away from anywhere his tree house could possibly be."

"And you want me to use the scanner to look for him?"

"Yes. Follow him out of here until—"

"But the scanner's range is *limited!* I can't just—"

"We've been thinking about that," said Sam. "As we understand it, the picture you get on the scanner is dependent upon where the graviton reader is. Right now it's in your office closet and all we can see is this general area around the clipper room. But suppose we moved the suitcase down to the end of the corridor and you took a reading from there? Then

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you'd have established a new range. After that we'll move it outside, then onto the lake, wherever it's necessary to go in order to follow him. Maybe we'd take it directly to Jenkin's Beach and start from there."

Bantry studied the floor. "Yes, that would work, I suppose. But it's *still* impossible! We'd have to have free access to the clipper room for an unlimited period of time in order to do everything you want to. So what it really means is that you've got me back here for nothing at—"

Sam took a step forward and spoke between clenched teeth. "Roderick. We have been *in* the clipper room; we have seen you and Bruce; we have seen what Bruce was looking at when you came in. Are you trying to tell us that Linda Rawlings doesn't *know* what you've been doing in there for the last six months?"

Bantry flinched as if he had been struck a physical blow. Finally he raised his eyes and glared at Sam defiantly. "All right, she knows. But the only reason I was . . . I was doing what you saw was to keep her from telling. That's the truth! I hate her! I *love* Emily! All I want to do is use the O-CLIP to—"

"I'm afraid that's something you'll have to straighten out later. In the meantime, you'll have to get hold of Rawlings and explain what we're going to do and get her to go along with it. You and I will run the clipper room. Emily and Marianna ought to be able to lug the graviton reader around and phone in its readings. That way there's at least a *chance* the cops won't find out what we're doing."

Bantry stared at him in disbelief. "You mean you're not going to try to tell anyone about—"

"Why should I? Get your Nobel, if you can. Just find Bruce for us and—"

"All right, all right, I *will!* Just shut *up* about it, will you! And go find that . . . that Rawlings and get her in here so I can talk to her." He spun around at the sound of Emily's sharp gasp and confronted her directly. "Alone! Let me talk to her alone!" His fists clenched and he directed a scowl of withering hatred at each of them in turn. "And God damn all three of you!"

Sam and Marianna fidgeted impatiently in the bucket seats of Marianna's old van as its autodrive took them with infuriating slowness along the shores of Eagle Nest Lake. The graviton reader sat in its inconspicuous suitcase on the floor between Sam's knees, while Emily's small white sports coupe followed the van at an unvarying distance of sixty-five yards.

"Do you really think this is going to work?" murmured Marianna at last.

"Yes," said Sam with more conviction than he actually felt. "I'm sure it will. We'll have Bruce back in no time."

Marianna turned to look out at the dark mass of storm clouds scudding above the lake's white-chopped surface. "This is a *terrible* invention," she blurted with sudden passion. "Even if it helps us find Bruce, it's still a terrible invention!"

Sam found himself nodding in mo-

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rose agreement. Here in the very first days of the scanner's discovery they had had a graphic example of the pain and disruption its existence would cause. What further turmoil could it bring the world when it became freely available? One thing was certain: privacy and trust would disappear overnight. It would be like handing a live hand grenade to every person in the world. Could this potentially marvelous invention, for which Roderick would one day surely reap the Nobel prize, ever be a boon for mankind—or would it forever be a curse?

"And what's going to happen," Marianna demanded, "when this wretched Federation that has you so upset finds out about the scanner? Tell me *that!*"

Sam grunted. "I think we can safely assume that they'll try to suppress all knowledge of it," he said dryly.

"And what about the man who actually invented it? What will they do to Roderick? And to people like us who merely *know* about it?"

Sam's grip on Marianna's hand tightened as he thought of the O-CLIP computer in the clinic's clipper room and how it could be used to utterly strip a man's mind of his memories. From there his thoughts leapt back to Project Zombie and the brainscrubbers at their research center in Belo Horizonte in Brazil and what they had done to Marianna. A chill ran up his spine.

"I don't know," he said finally. "But I think that with a little forethought we ought to be able to protect ourselves. I've had a few thoughts that—" He broke off as the van came to a smooth stop in a tree-lined parking lot. "Here we are at Jenkin's Beach. Let's see how close we can get the van to where the canoes are pulled up. If it looks like we're too far away for a reading, I'll get the suitcase out of the van into an inconspicuous place and then I'll head back to the clinic in Emily's car."

Marianna nodded. She leaned over to hug Sam tightly. "We'll find him, Sam, we'll find him. I just *know* we will."

The day after the ambulance returned him to the Hallowell Trauma Center, Bruce had recovered enough to give Marianna a reluctant account of his misadventures.

Three weeks earlier, on the evening he had overheard his parents discussing the time scanner, he had decided that the opportunity had finally come to gain access to the forbidden O-CLIP computer. He had therefore focused his attention on Roderick Bantry. It was, he grinned to his mother, easy to tap in to Uncle Roderick's supposedly private computer files and browse through the notes Bantry had made about possible means of circumventing the clipper room's defenses. After that it was just a matter of sneaking in and learning how to use the computer. The latter task had taken a full seven minutes. It was on his third surreptitious entry that Bantry had caught him.

"He didn't really *hurt* me," said Bruce proudly from where he lay in bed with a cluster of monitoring cables attached to him, "but he sure

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scared me! He looked *really* scary when he came walking across the room at me."

Bruce ran from the room, through the clinic, and out into the night. He was afraid of going home, because that was where Roderick would expect him to go—and because he was afraid that he would be forced to admit what he had accidentally seen on the scanner. So he decided to go to the only other refuge he could think of: his tree house. He pushed the canoe to the water, jumped in, and turned on the small but efficient waterjet propulsion system; normally he liked to paddle it like the old Amerinds used to—but tonight the only thing that mattered was speed, speed, speed!

Halfway across the lake Bruce was gripped by a sudden irrational panic: everyone knew of his secret tree house, including Uncle Roderick. Suppose he came looking for him *there?* He didn't *think* anybody knew where it was, but suppose he *did?* There he'd be, sitting alone in his tree house in the nighttime, with all sorts of creepy noises in the woods—and with Uncle Roderick at the bottom of the tree waiting for him to come down. Or maybe he'd even try climbing up after him! Uncle Roderick was *strong!*

Bruce shuddered and quickly changed directions. He'd go all the way up the lake to Jenkin's Beach. No one would think of looking for him there. Somehow he seemed to have lost his wristphone, but he still had his debit card. Even in the dark it showed that he had $16.97 of his allowance left: he could buy breakfast and think of what to do next. He thrust his paddle into the water to help out the softly purring waterjet—every single second counted!

At the landing he'd beached his canoe and gone to the café to breakfast on lemon Danish and a chocolate milkshake. He was about to hand over his debit card when he noticed a man at the counter staring at him intently. He knew that what he had done was a federal offense. Could they be after him already? He grabbed the DC from the waitress's hand and dashed for the door. Two more men were standing over his canoe, pointing at it. He swung around and ran for the woods on the other side of the road. Once in the forest he ran and ran and ran—until he tripped on a fallen tree and broke his ankle. After that there was nothing to do except to wait for Marianna to come find him.

"I knew you would," he smiled wanly. "Only I thought you'd probably see me from your hang glider." He shook his head in disgust. "I must have been really hurt to be so *stupid*: I never even thought of using the scanner! If I thought Uncle Roderick could have used the scanner to find me, I'd have been *really* scared!"

Marianna had just finished telling Bruce's story to Sam when Emily joined them in her office. A moment later Roderick Bantry and Linda Rawlings came through the door. The five people eyed each other with varying degrees of awkwardness and enmity. No one seemed eager to speak.

"It looks as if we have no choice," said Sam at last. "If any one of us tells

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on the other, we all go to jail."

"Speak for yourself," said Rawlings in the disdainful voice that so irritated Sam. "I had absolutely no idea that any of you were—"

"Would you like to see the pictures of you and Roderick in his office together? And then tell your story under perceptualization enhancement? No? Then be quiet unless you have something constructive to say." Sam's arctic blue eyes moved from one rigid face to the next. "Well, what are we going to do about all this?"

Twenty minutes later they had hammered out a series of bleak agreements.

Emily and Roderick would divorce—and Roderick would marry Linda. "We'll send you a card from Stockholm," murmured Rawlings with a taut smile as she clutched Roderick's arm and he scowled furiously. "I believe I read that last year's prize was just a little bit over $4 million. . . ."

Emily opened her mouth for a long moment and then snapped it shut. With a disdainful shrug she agreed that Roderick could use the clinic's O-CLIP computer long enough to be able to duplicate his work elsewhere.

Sam would use whatever influence he had to help Roderick disclose his findings in a way that would shield their activities at Eagle Nest Lake.

And Bruce would never, ever reveal what he had seen and done.

Roderick Bantry cast a long, bitter look at his wife, then tore himself from Linda's grip and stalked from the room, his eyes glistening. A moment later Rawlings rushed after him, her face dark with anger. Sam pulled Emily to his chest and wrapped his arms around her as she began to sob.

* * *

Sam and Marianna walked slowly through the clinic's meandering corridors after bidding their son goodnight. Sam glanced at his wife's tightly-drawn face. Was she considering the contemptible bargain they had been constrained to make with Linda and Roderick earlier in the day?

"I was thinking about Roderick—and us," said Marianna softly. "And the Federation. You think they're going to—"

"Yes. But even the Federation isn't all-powerful. Maybe they can suppress a college professor, or even a United States Senator. But they can't suppress Harvard or Oxford or the Sorbonne or Apple-IBM. Not if we do it right. Somehow I'll fix it so that someone in that league shares the credit with Roderick—and the blame."

Marianna looked at him hopefully. "You *really* think that will work?"

"It's something we'll have to try. The scanner isn't *all* bad, you know. Look how it helped us find Bruce. And someday it'll wipe out crime entirely, the little that perceptualization enhancement hasn't already. Think of a policeman—armed with a court order, I suppose—using a scanner to go back and solve all the unsolved crimes of the last twenty years just by sitting in his office. Policemen, historians, genealogists, there's going to be a great big constituency of people who'll do whatever they can to keep it from being suppressed. Including ordinary people like us."

"You mean no more crime? Not ever?"

"No more crime—ever. And there's one other thing, you know." He pulled the door open and they

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stepped into the cool night air.

"Yes?"

"We've *got* a time scanner—an actual, working time scanner! Somehow, by the time Roderick leaves here, we've got to get him to extend its range. And to leave us a graviton reader. And then—" he chuckled harshly.

"And then?"

Sam took his wife by the arm and guided her toward the lake. "And then we'll be able to see them coming for us. We'll have the most powerful eavesdropping machine in the history of the world—and they won't know it!" He chuckled again. "No matter who they are, or how powerful. I'd like to see the looks on their faces when they find us waiting for them—and loaded for bear."

"Yes . . . yes, I see. Oh, Sam, that's *wonderful!*"

"Wonderful?" Sam glanced up at the great expanse of twinkling stars as he pondered what the future held. "Maybe. We'll just have to wait and see." He pulled her against him and they moved off into the night. ■

EDITOR'S NOTE: This story is a sequel to "Under the Wings of Owls" (January 1994) and "To Change a Memory" (March 1994).

Delta Clipper, 1993

Marianne J. Dyson

A bird in the heavens
a rocket with feet
tucked in its belly
learning how to fly
a new species
with no wings.

It hovers on heat
above desert sand
yet slides on ice
blue sky and roars
its translation
of human dreams.

Gently it descends
straight as an arrow
pointed to the sky
settling on a nest
of yellow flame
that holds the future.

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Probability Zero

TYPECASTING

W. R. Thompson

Dear Stan:

Like most righters I have my horror stories about the thinks which typesetters have done to my stories. Until now I haven't complained because I didn't sea any point in gripping about it. Sure, it's annoying to have the meaning of a passage or an entire story demolished by a typesetter's solitary goof. In fact, it sometimes seems that, like a commando planning a raid, they are often weighting and looking for the one place to dew the moist damage. I swear, their seems to be something in your typesetters that makes them do this, as if they were cursed.

Consider what happened to "On Tour With Guess," in the October 1993 *Analog*. The first line on pee 104 *should* reed "when it comes to satisfying his curiosity Gyez is quite amoral." That's the way it red in the story I cent you, and that's the weigh it red when I returned the page proofs, but I saw read when I looked at the new *Analog* and found it had terned into "when it comes to satisfying his curiosity Gyez is quite normal." Despite going over the page proofs three or four times—I am proud of that story and wanted everything done right, damn it—somebody inserted this change after I had dun the proofreading.

Most riders would just sigh and chuck it up to terminal myopia. Other would call down maledictions upon our "modern" educational system, in witch spelling has become an arcane art and kids are taut by milksop instructors to "recognize hole words" rather then to read the old-fashioned whey. Well, I'm not most writers. Despite the WASP name I'm basilically Irish Catholic, which means I've got an impressive tamper. When I saw this error I boiled over and decided to take matters into my own hands.

Egged on by my ire, I headed for *Analog* headquarters in New Yolk, where I intended to have weirds with the first *Analog* typesetter I found. Let me tell you that finding your typesetters was a pane in the glass. Every time I asked for directions on how to fine a typesetter I was referred to Belly View, which is not as appropriate a place for me to lurk as you might think. Once I got out of there, however, I made progress.

Well, at first it seemed like prog-

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ress. After I got past all the hoofers on Broad's Way I found your place off business and started searching the building. Eventually I potted a sign with an harrow on it—and it led me to the basement, the typesetters, and a genuinely arrowing experience.

Stan, have you ever seen your typesetters? Now that I half, I can tell you it's an experience knot to be described—at leased not in a family magazine. I took won look at them, and I took off like a canny-asked baboon. I when back to the bar where this adventure had started (I toiled you I was bowling mad, or at least boiled) and had a few rounds to fortify myself for the next round.

As I towed you, I'm Catholic. I spent a dozing years in parochial schools, and you wouldn't believe all the things I learned there. One of those things is something that mite be called "Howl to Recognize the Enemy." No doubt about it, we're literally bedevilled by typographical errors, and watt I found certainly explains why my stories seem to go to hell when your infernal typesetters lay their hands on them. It's a curious but interesting bit of theology at work here, and quite logical in its way. Lies are by definition imperfect, and the Devil is the Father of Lies. Hence, any typesetting done by his minions must be imperfec—and the grater their presence, the wurst the perfections.

There is a certain cunning to the way in which the Old One has set up a beachhead in your midst, occupying the lowest levels of your building by disguising his agents as typesetters. Stan, *Analog* is the last bastion of rationality in this world, and no one of your staff would ever thing to look for devils, the very creatures who put the imp in imperfect. Even if you happened to penetrate they're magical screens, you and yore staff would surely look for some rational explanation of what yew saw. You'd fight them with death raise and giggle counters, and that, I'm afraid, wood be one Hell of a blunder.

But you must fine sum way to exercise the demons who plague your typesetting staff—you *mussed.* End fur Got's sake, hairy! As eye said, *Analog* is the last bastion of rationality in this whirled. The opposite of rationality is superstition and illogic, the fairy things on which the Farces of Darkness feed. If the Powers of Evil ever overcome *Analog,* there will be nothing to keep all Hell from breaking loose.

Best,

U. B. THOMPSON

A note from our senior typesetter: The foregoing is a work of fiction. You may rest assured that there is nothing supernatural or evil about Analog's *typesetters, and that this talk about how we are theologically required to make errors is nunsense*

—B.L. Seepup. ■

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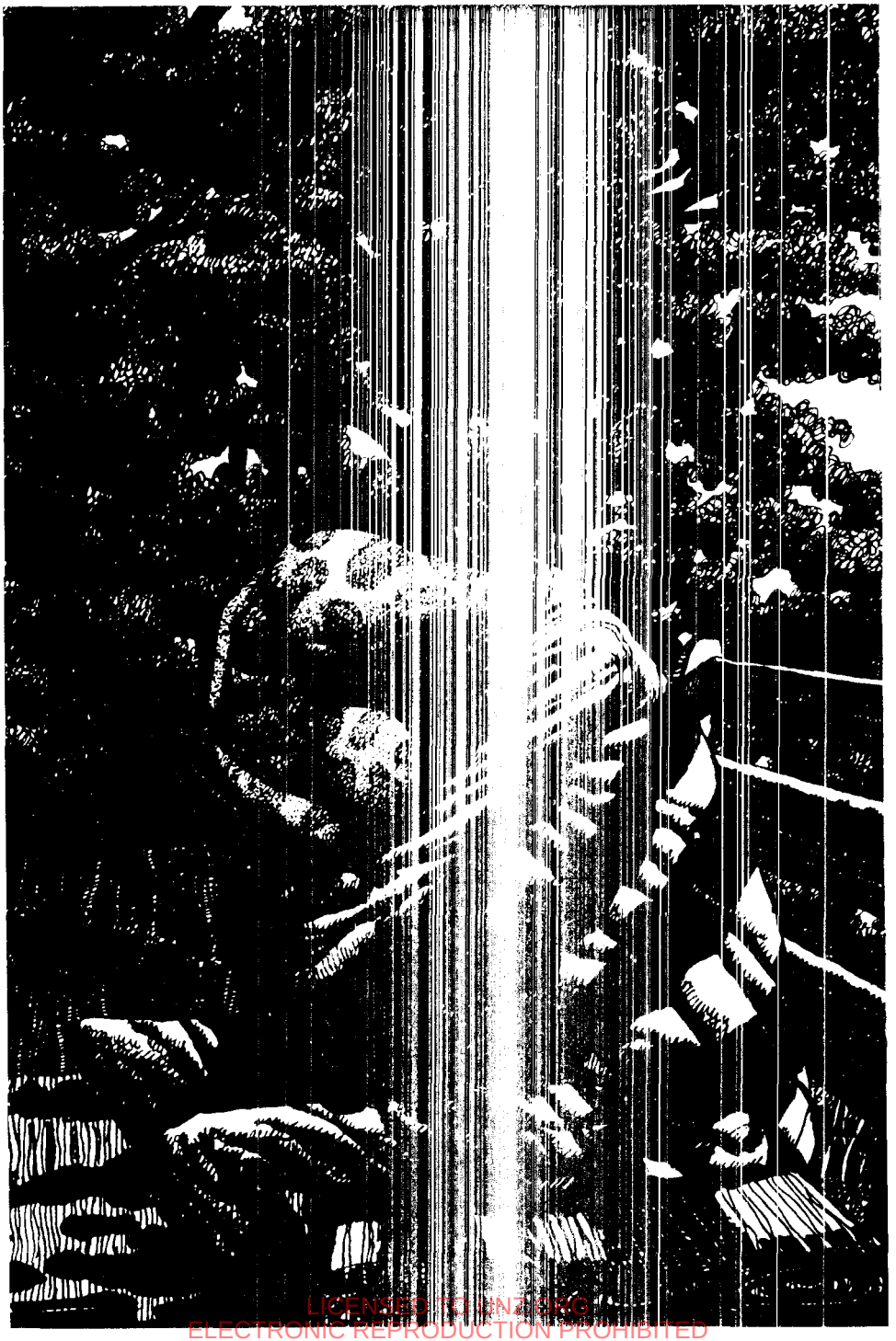

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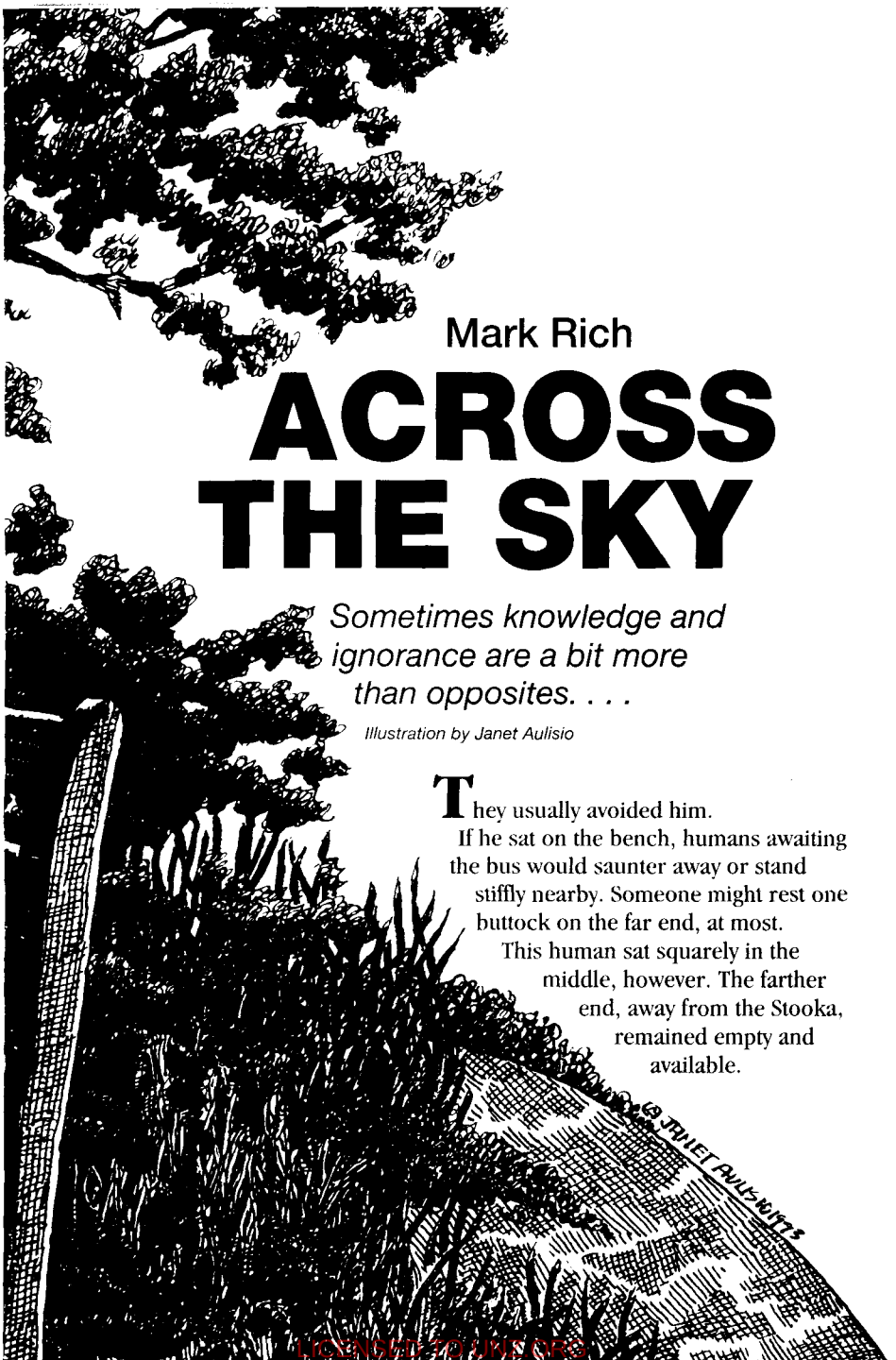

Mark Rich

ACROSS THE SKY

Sometimes knowledge and ignorance are a bit more than opposites. . . .

Illustration by Janet Aulisio

They usually avoided him. If he sat on the bench, humans awaiting the bus would saunter away or stand stiffly nearby. Someone might rest one buttock on the far end, at most. This human sat squarely in the middle, however. The farther end, away from the Stooka, remained empty and available.

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"Hello," the Stooka said.

"Hello," she returned, looking up and squinting against the Sun.

Stivra's surprise drained away. She was small, after all. The little ones, the young ones: they saw Stookas entering and leaving buildings, going about Stooka-on-Earth business, and heard the usual phrases being uttered: "Hands across the sky!" "Let's talk trade and help us both!" They accepted Stookas as part of Things As Usual. Children possess such flexibility universally. They adapt to change most quickly.

The Stooka resumed avoiding distressing thoughts.

He was avoiding thinking about the *millewettra* of his long-time companion, Ghedwe, who remained behind on the Stooka home world, Tevverina.

Pictures appeared in Stivra's mind of lovely Ghedwe as she used to be. On the outside she must still remain the same. On the inside she would have changed. No one knew how much. Not even her. In the Stooka nervous system, concentrated in several ganglial sites and extended by means of hollows through the entire skeleton, nerve cells realize a potential for migration at birthing time. In addition to genetic contributions from the male and female—in this case, from Stivra and the mother, Ghedwe—the mother contributes certain nerve cells to the newborn. Brain cells. Thinking matter. Sometimes a part of her personality goes into the newborn. Usually, a part of her memory.

There, he thought to himself. *I've failed completely in not thinking about it.*

The girl turned something in her mouth.

"I've got a loose tooth," she said, noticing his gaze.

"A loose tooth?" Stivra said, astonished.

"It's going to fall out." She grinned proudly.

"That happens often?" He'd never heard that humans loose skeletal parts. Unthinkable among Stooka. The bone ridges for chewing, like other parts of the skeleton, include nerve channels, and so hold a part of the extended grey matter of the Stooka.

"Often? Oh, I guess," she said, kicking her legs. Her feet reached within a few inches of the pavement.

"Doesn't it hurt?" Stivra said. He imagined a bone falling from his head. He shuddered.

"Nah," she said. "My mom says it's a part of growing up."

"It sounds—" Stivra searched his mind for the right word. "Grotesque," he said.

"You mean *gross?* Nah," she said. She grinned mischievously, then widened her smile. "What do *you* lose, when *you* grow up?" She wiggled her loose tooth at him.

The sight of it shocked Stivra. Still, he understood the tone of the question. The human sought a point of commonality. She made a gesture of friendship. *Hands across the sky,* as the Stooka leadership instructed him to say, in promoting good relations. *Hands across the sky, in friendship.*

"Well," he said. "We grow steadily, not in spurts, as I guess you do." He

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kept thinking. "We grow taller, our legs and arms get longer."

"Yeah," she said, with a note of boredom.

"We're not so thin as before. Not so wispy."

She nodded and looked away.

He suppressed a mild panic at her reaction. She was losing interest. Having made this much conversation with a human, he hated to stop. "But we *do* lose something," he said, feeling a twinge.

"Yeah? What?" The girl looked up with new animation. His mottled, greenish skin and bristly face obviously disturbed her no more than any of the fantastic apparitions parading their lives on television each morning.

"We lose something very hard to lose," he said, not wanting to say the words.

"What? What?"

He hesitated. "Some of our *brains.*"

She stared. "Yeah? Wow," she said.

Stivra recognized her look. Her eyes widened in a peculiar way. He once saw the look in the face of a young man in a suit who said, "I'm very interested, very *very* interested," after Stivra told him about a sponge his company had developed which readily expanded four times in absorbing hydrocarbon liquids but repelled water. "Very interested," the man said again, scribbling on a note pad, his zeal unflagging till he saw the manufacturing problems.

"In growing," he said to the girl, "we match ourselves with another Stooka. When we reach maturing time, we bear children, one each. We may do it at the same time, or in a staggered fashion, so that first we have one child, and then the next."

"You *both* have children?" she said. She said it as if she'd heard about dual Stooka motherhood before, although she might not have believed it.

"We're not so strictly male or female, when we're young. More of one than the other. I'm male, in your terms. But yes. We both do."

"Wow," she said. "But what do you mean, you lose your *brains?*" Her interest kept her glued to that point.

Stivra's arms sagged a little where they rested on his legs. He'd intended to avoid thinking about this.

"Part of our brains go into our newborns," he said, trying not to sound pained. "Some of our brains—*crawl*—maybe a better word is *slip*—into the embryo. When the baby is born, it has some of the mother's brains in it. It doesn't happen that way, with you humans. You'll have a baby, but you'll keep all of your brains. Don't you think you're lucky?"

"Yeah." She sat absorbed in thought, staring blankly at the road.

Then something must have crossed her mind. She straightened and looked with singular directness at the Stooka. Her look had a nearly accusatory aspect.

"Have *you* grown up yet?" she said.

"No," he said quietly. "But, soon."

Her manner softened immediately. "Will it hurt?"

"I don't know," he said.

"Ah, come on. Didn't your mom tell you?"

He laughed internally at the thought. All Stooka were mothers, yet

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none had a "mom." Because of the odd psychological conflicts that arose when a child inherited a part of the parent's mental equipment, Stooka never raised their own young; communal nurseries did. "No," he said, not wanting to explain fully. "I was given—conflicting reports." The words dissatisfied him. They felt like board room and professional words, not words for a small human. He dealt so little with small ones.

"Oh," she said, as if gleaning a taste of meaning.

Thinking of *milewettra*, he found himself suddenly *mechkan*—much like *crying*, in English. He hoped the girl would stay calm. *Mechkan* passed contagiously among Stookas. The liquid emerging from ducts below his eyes and above his sensory bristles looked like diluted blood, thin and red. It pooled and dripped toward the mouth. Sometimes a circle of Stooka might sit around in *mechkan*, offering each other consolation pats.

"Wow," she said. "I didn't mean to—I mean, I didn't know it was so—*serious.*"

"It's nothing," he said.

He pulled his red, human-style bandana from his pocket and dabbed at his tears.

"Wow," the girl said again.

The bus rolled up. The arrival of distraction cheered Stivra. He greeted it with a wave. By now he accepted his inability to break the Stooka habit of waving to large vehicles. Humans apparently never did so.

He entered the bus, listened with satisfaction as the coins clunked through the coin-counter, and took the first window seat. He hoped the girl would sit next to him.

He made a human grin as she neared.

She, too, apparently wanted a window, however, and sat two seats away.

Stivra turned his face to the glass.

Two smells combined in an exotic and vaguely sickening mixture: the smoke of cigarettes and beer's pungent aroma. A whiff of ammonia-based cleaner provided a faint undercurrent. Pop music, drum-heavy and colored by electronic distortion, embraced him with its violent textures and incomprehensible vocal lines.

A few heads turned, followed by a few more, as Stivra found a seat. Other Stookas visited Golding's Silver Dollar. Stivra had heard about it from one of the nurses, Ittasta, when he went in for a preliminary scan. A Stooka here could feel vaguely out of place, but not entirely. The heads that turned to look soon looked away.

Stivra requested a tap beer, and sipped it when it arrived. Beer resembled a nutritious drink of the Stookas, in a diluted fashion. It felt good drinking something redolent of home.

Someone noisily pulled out the stool next to him and sat down.

"Hi, buddy," the man said, glancing at him with a smile before slapping a ten on the counter. He shouted his order to the bartender, and grinned when she brought it.

"God, I thought to myself, why not?" he said to Stivra without preamble. He carried considerable weight on his bones. His dress indicated an

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office job, though not a highly placed one. "I've always wanted to meet one of you guys, and here you were sitting, and I figured to myself, why the hell not? Hi. My name's Tom." He held out his hand.

"Stivra." He shook. Tom's hand felt cool.

"Stivra, huh? What a name. Well, good to meet you. You here like everyone else, drinking to forget?"

"Drinking to forget?"

Tom put up his arms in the mock-surrender position. "Hey, don't look so alarmed. Just a joke. People drink to forget, sometimes, hey? It's just kind of strange with you here, aliens and all, knowing all kinds of things we don't know about, and here you are, Steve, at a bar. You guys don't ever feel so bad you've got to forget anything, do you? I always figure you've got your heads on pretty tight, you know. Brainy guys."

"We have some things we might feel badly about, I guess," Stivra said.

"Yeah? Like wives, huh?" He took a long draught of beer. "I've been getting over my divorce, myself. Not that it's that bad, getting over it. I feel pretty good, in fact. I let her go, and I'm a new man. But you, what do you have to gripe about?"

The man amused him. "I *am* troubled about something that—well, it's this way. We Stookas go through a period when we forget things. I'm worried about it. It's coming up for me. That time of my life."

"No kidding," Tom said. He finished his beer and motioned for another. "That's pretty interesting. But you must be used to it, if it's a natural thing. Forgetting and all. I mean, we do it all the time. Hell, that's why I'm here." His grin increased. "I'm here to forget my wife. I hope I forget her good!"

"You can do it intentionally?"

"Sure as hell can try, Steve. But what's this that you want to forget?"

"It isn't something I want to forget," Stivra said, then added, "Tom." He felt good, remembering the friendly rejoinder of the name. "It's that I don't want to. I'm going to forget something, and I don't know what it'll be."

"Well, tell someone everything you know, and then have them barf it back at you when you're done."

Stivra smiled in the human fashion. "On Tevverina, that's what we do. We get together a circle of friends. We spend time together as youths, and get to know each other—our personalities, our interests and passions and ambitions, maybe even our obsessions and peculiar talents. We're all of an age, so when the time comes—when we forget—we have a group to go back to, and that group *remembers* what you were. It's almost like becoming bigger than yourself, you see? Some parts of you spread out into the group. Those

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parts of you aren't just yours, any more. It's the whole reason—"

Stivra stopped. Tom was nodding, apparently listening. His eyes traced the movement of a blonde across the floor, from the bar to a table.

Tom picked up his glass and nearly emptied it.

"Talking about forgetting, you know what's really terrible?" he said. "Last Saturday. Here I was. This very bar. Drunk as a fish. Wetter than a washcloth, and if you'd wrung me out it would have been two pitchers of beer you squeezed out. Hell, three pitchers, no lie. And here was this woman. Beautiful, let me tell you. A real woman, a looker like you wouldn't believe, only a sensible looker, you know? Not too much flash, just a natural good-looking woman. And she and I got talking. Hell if I know what we talked about. We talked two hours, Steve. At least two. Maybe more. I had this jiggly feeling inside, you know? Like she could really be someone, you know, who'd be good for me. Real good. Well." Tom looked over at Stivra, and tapped his empty glass on the bar. "You know what? Sunday morning. I wake up. I can't for the life of me remember her name. I can't remember her name at all. Could have been the love of my life. And I couldn't remember her effing name. Effing crying shame. Can't call her or nothing cause I don't know her name." The bartender had come over at the tapping of his empty. Tom looked at Stivra again. "You want another now?"

Stivra finished his, now that it was warm. He liked it better warm. "OK," he said.

"Now what was it it you wanted to forget again?" said Tom.

Stivra sat in the chamber. He emptied his mind to keep himself still as possible.

After a moment, the door opened.

"All right," said Ittasta's voice. "We're done."

"That's all?"

"Enough for now," she said. "You're getting close. I say you should be back here in two days and go into the pre-birthing sleep." She appeared around the frame of the door and motioned him out before returning to her desk. Short for a Stooka, and elderly among the ranks of those now working on Earth, Ittasta exerted a quiet authority over the embassy health services center, more often with pleasantries and old-fashioned shows of affection than with administrative rigor. Stivra never hesitated to visit, as a consequence.

"Two days?" he said. "I hardly feel ready."

"Your body's ready."

"And the baby—"

She made a circle with one hand. The Stooka gesture of general agreement looked odd to him, so much time had he spent among humans contemplating their ways. "Your baby is especially ready. So. Two days?"

"Very well," he said. "Do you know—"

He was going to say: *Do you know I have no circle? I have no one to tell me if I forget things? How will I know*

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the birthright I give to my child?

"Yes?" Ittasta said. "Do I know what?"

"Sorry," said Stivra. "Wandering mind. I'll be here. In two days."

When he came down the stairs from his apartment, the surly man on the second floor, Mr. Huggins, eyed him with mistrust as he picked up his morning paper. Stivra knew the man could barely bring himself to say hello, let alone allow a friendly expression to cross his features. That Mr. Huggins showed the same face to his fellow humans gave Stivra no consolation today.

Outside, on the sidewalk, people cleared a swathe around him. They made extra effort to avoid him. He knew he must be imagining it. They made the effort mutually, after all. The humans avoided his path as he avoided theirs. They walked as they always walked on the city streets, albeit with a minuscule amount of consideration for the difference between species. Every day before this one, they and he had walked the same way, with the same considerations and the same slight apprehension. They felt uncertain about him, and avoided impinging on his space. He felt tentative about them, and deferred to their walking paths whenever possible.

Today, however, he sensed their avoidance acutely. His raw skin registered the slightest bruise of averted eye or veering step.

He reached the bus stop and sat alone on the bench while a small crowd of humans gathered behind him, standing. Even a small, bent, old woman who clutched her shiny black purse would not take a seat. How could he make an effort at bridging the gap if they wouldn't?

He almost cried. *Mechkan.* He might well sit here, in tears—

Instead, he gave up.

He gave up going on two more days. He gave up on the charade. He gave up the illusion that the creature he saw in the mirror, the Stooka with odd skin and rows of bristles and wide, thin lips, could ever become a face to which a human might turn in friendship long enough to preserve a bit of him in memory.

He got off the bench as the bus arrived.

The being he would become stood in his place, in his imagination: a Stooka, riddled with holes.

He walked back to his apartment and started feeding himself the drugs that, in two days, would leave him insensate.

At least he knew one thing he would lose: He would emerge with no memory of even the birth.

His head—his body—they felt—

They felt fine.

Gone? Nothing that he knew was gone. The child, yes. Gone to far-away Tevverina. But his memory—

He remembered all his technical knowledge. A scan of the knowledge he needed in his work—his sheer boredom in going over it—showed that well enough.

He sat on the bench and put on his dark glasses against the bright Sun.

Someone sat lightly beside him.

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Stivra looked and saw a girl dressed in light material, with her arms and legs exposed to the Sun. She met his gaze and grinned.

"Hello," he said.

"Hi," she said. "Remember me?"

"No."

She still grinned. "You silly. We sat here. I told you about my loose tooth. You told me about your brain."

"Oh yes," he said. Did he remember? Some items fell into place: the loose tooth, yes. After a moment he could remember the loose tooth with perfect clarity—without remembering the girl, however.

"You never told me your name," she said with great seriousness in her face. "I'm Alice."

"Alice. Pleased to meet you again." He smiled at her. "I'm Steve. So. Did you lose your tooth?"

"See?" She grinned widely enough to show a gap in the white row.

He stared, unable to do otherwise.

"So did it hurt?" he said. "Did you feel anything?" He remembered how one of his business contacts had spoken, and used the words: "I'm *very* interested." He didn't think he could communicate the sentiment with his face, especially from behind dark glasses.

Her face glowed. "Didn't hurt a bit! I kept wiggling it, and then—I *pulled* it out!"

"You, yourself?" He wondered if he should be shocked or only surprised.

"And now, you know what?" She grinned to show the gap and the tongue-tip she stuck into it. "I can feel the new one coming in."

Of course, he thought. Humans grow new teeth. It should have been obvious, yet it had never occurred to him. Stookas grow new nerve cells after *millewettra*. Still, it seemed a different thing.

"It's a little tiny hard lump," she said. "But it's pretty neat. The skin around it's all soft and squishy." Then she showed how she could part her lips on one side and blow without unclenching her teeth.

He adopted some of her vocabulary to show appreciation: "Pretty neat," he said.

She leaned slightly nearer him. "Are you grown up now, too?" she whispered.

He noticed that word: *too*.

He thought about what the question meant, leaned in her direction, and nodded gravely.

She squirmed with delight. "Did it hurt?"

He shook his head. He recalled the tiny, solemn-faced, grey-skinned child being held to him for viewing by Ittasta, only a few days ago. A foggy, drug-bleared image, it meant little to him. It felt like it belonged to someone else. The grey child hung there in his mind. *His* child, biologically. But mentally? What had been the birthright?

"And—your *brain*," she said, hissing her words out. "How does your *brain* feel?"

"Well," he said, remembering his fear of losing memories. "I think it's like your tooth. I poke around the place where something was—but don't feel a thing."

She nodded solemnly, as if his words confirmed some deeply held

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opinion.

"And your tooth," Stivra said to her. "What's become of it?" He imagined humans would treasure their bones, especially ones that fell from their heads. Teeth would be too precious to throw away.

"I traded it," she said.

"Traded it?" The Stooka wondered when this little human would cease astonishing him.

"For this." She fished something out of a pocket and held out her hand. In it, she held a coin. "It's real silver. My mom said I'm never to spend it. It's just for me."

He admired it. "Ah," he said. Then he remembered a point of vocabulary, dredged from reluctant memory but perfect for the moment: "Wow," he amended.

She nodded, acknowledging his show of appreciation.

When the bus arrived, Stivra waved, and got on with the girl behind him. He listened to the coin-counter with satisfaction, and paused long enough to listen to the girl's coins as they chunked down in their turn—the silver one not among them, he noticed.

A sudden flash of understanding struck him. He knew what his child bore in her mind, and what she was taking across the light years to Tevverina.

Only through his losses did he know her.

His child would remember Alice on a bench. His child might be the first with a predisposition to like humans. She would grow with memory of a human child sitting nearby and smiling. A memory of a young, accepting human.

"Hands across the sky," he said to himself. He headed for the first open seat in the bus, and then paused as a vague recollection nudged him.

He let Alice have the window seat. ■

Nature does not care whether the hunter slays the beast or the beast the hunter. She will make good compost of them both, and her ends are prospered whichever succeeds.

John Burroughs

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THE ALTERNATE VIEW G. Harry Stine

ANALYSIS PARALYSIS

The term, "analysis paralysis," has been kicking around the government contracting industry for several years. It describes the consequence of not being permitted to make a mistake.

As many of us know, science isn't a mistake-free domain. The Scientific Method itself is a paradigm for analyzing and catching mistakes. It's a rigorous process. First make the wild guess, then formulate the hypothesis, then test the hypothesis, then create a theory, then test the theory, etc. Along the way, a mistake gets discovered and tossed out. You can't fool Mother Nature. (But she can fool you!)

However, these days grant-supported scientific inquiry doesn't use the Scientific Method very much because, with government funding, you're not supposed to fail. Even the grant process—to say nothing of the contractual demands of the applied science province—requires that an investigator have everything pretty well laid out in advance and thereby ensure (at least for the investigator if he wants more grants) a high degree of success.

Exceptions exist, of course. They always do. The Universe is full of exceptions. See any text on statistical analysis.

Engineering involved with government contracting has been hurt the most by the requirement that no mistakes be made. You're expected to produce a product that absolutely and positively meets page after page of tight, strict, almost impossible standards and specifications. The object of this exercise is to make sure that the government gets what it says it wants with tax dollars. The feather merchants have been ripping off the military since Pharaoh Thutmose III fought the Battle of Megiddo I (and probably before that as well). Current procurement regulations and mil specs are designed to prevent this sort of abuse. (Do they? Ask anyone who has been in the armed services—any year, any war.)

This procedure naturally leads to extremely expensive government-used products. Mil specs are tough. A lot of engineers have told me they'd rather work to something called "best commercial practice." But BCP isn't all that easy, either. The differ-

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ence comes in who tolerates how much mistake-making.

The government contracting officers, Congress, and the news media don't tolerate any mistakes at taxpayer expense.

Corporate managers will tolerate mistakes up to a limit, that limit being the point where they'll lose money or, at the worst, have to bet the company.

I've been involved in some commercial product development jobs in the past several years where mistakes were made early in the prototype phase, more mistakes discovered in the production phase, and yet more mistakes discovered by customers who reported them in great detail. For example, I went through my first software alpha and beta test operations with the Brøderbund *Discover Space* computer program. (It's bug-free in its production version, but a couple of errors still remain in the text and visuals. What are they? You find them! The simple proof is left....)

In any creative work, you always have to watch for mistakes, knowing that they will always be there. You try to catch them as quickly as you can and correct them as quickly and cheaply as possible. Then you try to get the next product out the door with fewer mistakes, if you can.

Even in the world of writing, an author is expected to make mistakes in spite of computerized spell checkers and the like. Catching these is, among other reasons, why editors exist.

(I once stated that I always left something for the editor to change. However, I was properly put in my place when an editor responded, "Yes, but do you have to leave so much?")

I can run a manuscript through spelling, grammar, style, and punctuation checks a half-dozen times and believe that I'm delivering a clean piece of work. It's amazing what a copy editor finds! And it's the reason I get a proof of this column before it's pasted up into the magazine.

Therefore, to err is human....

But in the world of government-supported scientific and technical work, you're not allowed to make mistakes. Therefore, it's mandatory that you study the hell out of everything first. This leads to spending Dirksens ($\$x10^9$), creating libraries full of paper reports and studies, and doing damned little tin bending. If errors exist in all these studies and reports, the price of correcting the inevitable mistakes becomes incredibly expensive when the metal is cut.

We have abundant evidence to support the contention that studying something to distraction really doesn't prevent mistakes. A lot of mistakes have occurred in government engineering work and the products that came from it.

The U.S. Army Corps of Engineers is, unhappily, one organization that has been caught by mistakes. Many of them have been long-term mistakes—that is, the mistakes weren't discovered until the project was completed and was in use for decades, in some instances. The Florida Everglades project is one of these.

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The southerly-flowing sheet of water that goes from Lake Okeechobee through the Everglades was dammed and diverted by this megaproject into a series of canals feeding the Miami area. As a result, the Everglades began to dry up after several decades. This is currently taking place. No one did the detested environmental impact study. (In fact, some people don't know how to interpret these studies today.) This old mistake is changing the ecology of southern Florida.

In correcting the problem, more mistakes will be made in spite of analysis and study.

When we toy with the forces of the Universe and don't do it right (we do it right most of the time), the Universe lets us know about it in no uncertain terms. This doesn't mean we should stop terraforming our world (which we've been doing for about 50,000 years, ever since our ancestors learned how to use fire) or halt technological progress in its tracks. The Universe does a lot of things that we view as mistakes because the Universe really doesn't care about species survival (including our species). If and when a species becomes extinct, other species will evolve to fill the vacant ecological niches. The real Universe is wanton, wasteful, and uncaring.

So in an attempt to beat Murphy's Law, meet mil specs, satisfy the contractual requirements, or ensure that the grant application is based upon work that will succeed, we resort to over-analysis. And this slows down the work.

Not all analysis leads to paralysis, nor is all careful study a waste of time.

When designing and building any device that could, under reasonably predictable circumstances, lead to the injury or death of other humans, it's a good idea to have someone else check your numbers or the drawings. It's also a good idea to build an X-vehicle or a prototype, boost it, and bust it if possible to see where it busts and under what conditions.

The people who designed and constructed airplanes were perhaps the first to do this, although a case can be made for military ordnance being the leader in the field. This in turn led airplane users, specifically the U.S. Air Force, to notice in about 1952 that more pilots were killed in automobile accidents than airplane crashes. So Colonel John Paul Stapp undertook the first car crash safety tests. It took a while for Stapp's pioneer work to catch on (although I put aircraft seat belts in my 1952 car after I'd seen the Stapp test results). Today's automobiles are paragons of safety engineering, although the use of safer autos hasn't significantly reduced the annual highway slaughter.

The concept of product safety caught on with the formation of the Consumer Product Safety Commission, for example. Today, the regulations of various government agencies are complex, barely understandable (even to the people in the agencies), and demand analysis and study of every "just suppose" safety aspect of a product or service.

This can be supremely frustrating to visionaries who make great leaps of intuition or pattern recognition,

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something they can accomplish and others can't. They see what can be done and want to make it happen as quickly as possible so it will lead to the next giant step for humankind (N.B. the PC terminology).

As a result, they believe we don't get done what we *could* get done because we spend too much time analyzing it so we won't make mistakes.

Hence the term "analysis paralysis."

Let us take an alternate view, as is our wont herein.

Maybe analysis paralysis can be converted from a problem to an opportunity.

If your project is funded and managed privately, you can design and build to the market requirements *and* to the published government and commercial standards. You do it without analysis paralysis. ***But be sure you follow the published rules!*** And be sure you don't dump on some government regulatory agency's sacred turf in the process. Communicate and cooperate with them. Otherwise, the safety wonks will get you even after the product or service is on the market.

And thus you are out of the starting blocks well ahead of other outfits who decide to "reduce risk" by seeking and using government funding through contracts and grants.

They are paralyzed by analysis. You aren't.

And you can then forge ahead toward new frontiers. ■

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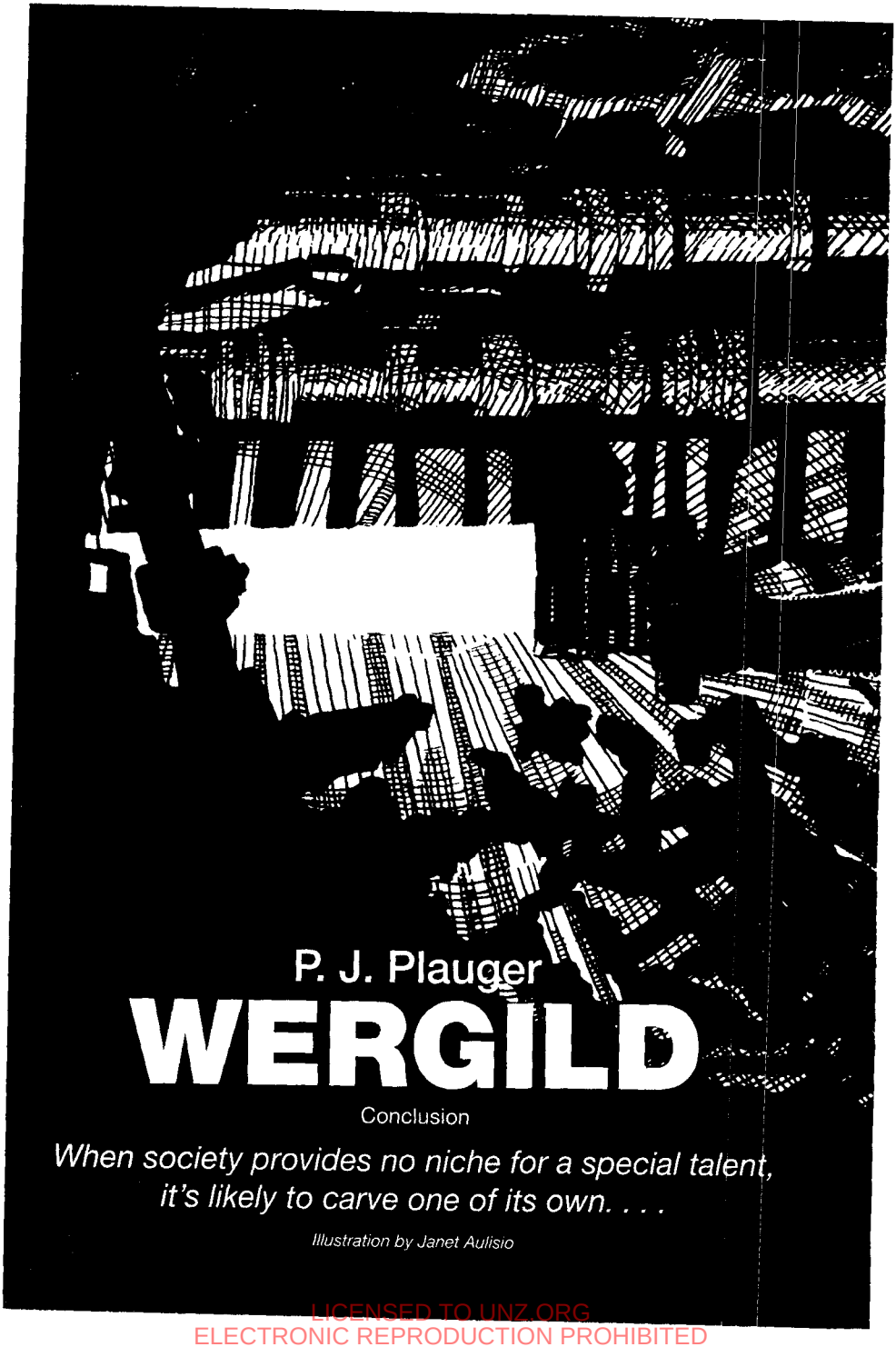

P. J. Plauger

WERGILD

Conclusion

When society provides no niche for a special talent, it's likely to carve one of its own. . . .

Illustration by Janet Aulisio

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SYNOPSIS OF PART 1

Tessie Luellen Crocker *is an attractive woman of twenty-five. Despite her businesslike exterior, she is still in many ways the romantic country girl of her Blue Ridge Mountain beginnings. She is also a professional assassin.*

She desperately needs the work, like so many struggling Americans. The economy is on the ropes after years of wild gyrations (the Triple Dip) and a forced day of fiscal reckoning (the Deflation). Now most American companies are virtually vassals to Japanese "sister" companies. Governments at all levels scrabble for taxes to service crushing interest payments to Tokyo banks. Gambling, drugs, prostitution are legalized, and taxed, to offset flagging revenues from conventional sources.

Assassination has also become effectively legalized after a series of court decisions over the preceding eight years. In the landmark Michigan v. Mulligan, **Judge Kumagai** *ruled that Michael Mulligan and the company that hired him were not guilty of murder even though he was paid to hunt down a man and strangle him to death. The judge cited the critical ingredients in avoiding a felony: Mulligan willingly paid* wite *to the state after the crime, in accordance with old English common law, amounting to the median lifetime income of an able-bodied American worker. He also paid an equal amount of* wergild *to the victim's family.*

Lansing paid Mulligan more than enough to cover these expenses, in advance, by a unanimous vote of the board of directors. In addition, Mulligan was not required to actually carry out the assassination. Finally, Mulligan demonstrated genuine contrition for his deed.

The Japanese public approved of the ruling, the Supreme Court sidestepped the matter, and the states welcomed another source of revenue. Now only the high cost of wite and wergild keeps murder for hire in check—that and the risk of capital punishment for all concerned if any of the legal forms are not properly obeyed. Thus was born a small and secretive cadre of assassins who are equally skilled in the workings of boardrooms and the niceties of law. Not the least of these is one T.L. Crocker

Tessie meets her latest client, **Randall Santee**, *for dinner at a Holiday Inn. He is a handsome and charming man, though still unmarried in his mid-forties. Over dinner, he sketches the steady and impressive rise of Santee Castings since its founding by his grandfather. This prosperity continued despite the wanton ways of his father, Dimitrios Santee, who ran the company until his death a few years earlier.*

Randall Santee reveals the company secret, the peculiar talents of his bastard half-brother **Arnie**, *born of Dimitrios and his mistress. Though physically crippled, Arnie is a "telempath," a one-way telepath who can broadcast powerful emotional moods. Santee Castings entertains guests and customers in the Edwardian Mansion House while Arnie lives there as a recluse, secretly shaping*

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the mood of these social occasions to the company's advantage.

But now Arnie has gone wild, a danger to others. He is the "subject" of Tessie's assignment. Tessie blanches at the thought of stalking a person with potentially powerful defenses. Then she realizes from Santee's behavior that Arnie already knows she has been called in. He *may already be stalking* her.

In Tessie's hotel room, she asks Santee to describe all he has learned about Arnie while growing up with him. Despite her rigid discipline and self-imposed rules, she slowly gives way to her passion for Santee. They make love and drift off to sleep. But Tessie soon forces herself to waken and fight off a stupefying torpor. Arnie has enthralled them both and is working his way into the room through the bathroom window. Her stubborn mental resistance forces him to flee.

Tessie sends Randall off to a distant motel for the rest of the night but she soon awakens to yet another assault—she lies in wait for the attack, only to find her room invaded by two policemen and a photographer, hoping to catch her unaware.

But Tessie turns the tables, attacking them in the dark and capturing the menacing gun from Detective **Ron Schwartz.** *His boss, Detective* **Joseph Heatherington**, *grudgingly reveals their plot to blackmail her into leaving town. Tessie concludes that this latest assault is beyond Arnie's putative abilities. Probably it was meant to capture her in bed with Santee and embarrass him.*

Santee picks her up promptly at eight to drive to Santee Castings. Santee professes that his feelings for her were not just induced by his half-brother, a revelation that both elates and distresses her. Businesslike, she focuses on the upcoming board meeting.

At Santee Castings, she is happy to find that two dozen Asahi Pinkertons have been brought in from Osaka as guards. The lieutenant in charge, **Tetsuo Shimizu**, *is a fellow neo-samurai. He quickly recognizes her as one of the half-legendary Daughters of the Winds. Among the neo-samurai and their followers, such as she are known to be unswervingly loyal to their clients and possessed of a determination that transcends even death.*

Santee leaves Tessie to the not-so-tender mercies of **Giles Edwards**, *the Chief Financial Officer. Tessie finds his insincerity and crass manipulations a source of continuing annoyance. She is rescued only by the ministrations of* **Edith Wilson**, *the matronly factotum on whom Santee wisely depends. From Edith, Tessie learns that Edwards is Santee's cousin—their mothers were sisters.*

The board meeting progresses badly. Insensitive to the dangers of departing from the Kumagai rules, the board tries to haggle over terms. Tessie delivers a lecture on the narrow latitude permitted assassins and the companies that hire them. But a crass remark from Edwards sends her storming angrily out of the room.

Tessie calls a powwow with Randall Santee and Edith Wilson. Tessie is amazed that the two are so tolerant of, or blind to, the antics of Edwards.

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Neither suspects that Edwards might resent being passed over as the successor to Dimitrios Santee. They have even entrusted Edwards with ensuring that Randall Santee has properly signed away any inheritance from Arnie, lest he be subject to murder charges for profiting from his half brother's death.

Santee finally reveals the reason that Arnie must die. He subjugates women with his talent for persuasion. He has progressed from preying on women on the grounds of Santee Castings to brutalizing the "house women," or resident prostitutes, from nearby hotels.

With renewed confidence, Tessie takes charge of the board meeting. She cuts through the clutter of alternate agreements and wins her unanimous resolution, on the terms she originally proposed. Tessie, Santee, and the contingent of guards will pay a visit to the Mansion House that afternoon to learn what they can of Arnie's current antics.

But this boardroom victory leaves her sadder than usual. She has become personally involved in the case, against all her principles. She faces a foe who has already demonstrated frightening offensive abilities. And she must now do something that she dislikes—what she joined the neo-samurai to help minimize. She must help Giles Edwards get away with the murder he so obviously fomented, for reasons as yet unknown.

PART II

Edith was waiting outside the board room when Tessie emerged. She was reading her way carefully through an assortment of documents. She favored Tessie with a tight-lipped smile.

"You were right about the assignment of interest in Arnie's estate, dear. The papers seem to have fallen out of Randy's In basket, down behind a filing cabinet. They're now signed and put in a safe place." Tessie knew better than to ask where that place might be.

"It might be interesting to see what else might have gone astray lately."

"I'm way ahead of you." Edith waved the sheaf of papers. "I know what needs to be done here, don't worry. You have enough problems that only you can handle." She gave Tessie the briefest of hugs. "They're waiting for you where you ate breakfast. Good luck, child." Then she was gone.

The men stood up when Tessie entered the room, but not out of chivalry. At her insistence, Shimizu introduced each of the men he had chosen for the coming assignment. The neo-samurai were not ones to ask sacrifices of strangers. To his credit, Santee introduced himself to each of the men as well.

They ate a spartan lunch from lacquered boxes: miso and smoked fish, relish and cucumber. After the rice was finished and the boxes cleared, they drank steaming tea in studied silence. It was the kind of meal that leaves many Westerners unsatisfied, the kind of atmosphere that makes them uncomfortable. For Tessie, it was just the grounding she needed before going into danger. She knew that it helped her comrades in arms

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as well.

Then Tessie spoke of the problem they faced, the responsibility that she had assumed on behalf of their clients. No details of intrigues within family or business, just the bald particulars of the threat posed by Arnie. She tried to describe how it felt to be attacked by a telempath, and so did Santee. She warned of emotions that seemed inappropriate, particularly overpowering urges. She emphasized Arnie's human limitations, for all his special powers.

They would enter the Mansion House, look around for any clues, then leave. She wanted signs of recent occupancy, any hint as to how Arnie had breached the perimeter of Santee Castings without being detected. She hoped there would be no encounter with Arnie, but naturally could guarantee nothing. Total time inside, at most half an hour. They would carry no weapons, lest Arnie somehow use one against them.

Shimizu issued supplemental instructions in rapid-fire Japanese. Tessie understood enough to approve. Top priority was to guard Randall Santee. In a retreat, he must be removed to safety first. Guarding Tessie came second, at least as long as her mission was unfulfilled. If she chose to sacrifice herself, her wishes must be honored. Otherwise, they would leave nobody behind, under any circumstances. The Asahi Pinkertons looked after their own.

Shimizu asked for questions. There were none. Deferentially, he asked Santee if he had any final instructions. Santee knew enough not to bother. Most of the instructions in Japanese had probably gone right past him, but Santee understood competence when he saw it.

They stood as one and marched outside. Office workers in the know watched them pass with that mixture of awe and pity that civilians reserve for combat troops. They came out into daylight to find a small fleet of golf carts awaiting their pleasure. Tessie had seen the small electrics darting among the buildings of Santee Castings from time to time. The Mansion House was only about half a kilometer away, but up a moderately steep hill.

Shimizu looked at Tessie with the nearest thing to a worried glance he could permit himself. Tessie understood. Turning to Santee, she said, "We're walking."

"Fair enough." Then, "May I ask why?"

She sighed to herself. *How to explain?* "Transportation is convenient at times, but sometimes it gets your body to a place before your mind is ready to be there. We'd rather not get ahead of our minds right now."

"I see." This time, Tessie thought that he really did see. At least in part. They set off on foot.

They cleared the factory buildings quickly and found themselves on a gently curving driveway through woodlands mostly left to grow wild. No overcultivation here. Tessie admired the foresight of the eldest Santee. To buy this beautiful parcel of land when it was still the outskirts showed economic wisdom. To develop it only as needed showed aes-

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thetic restraint. For all that the Santees were a troubled lot, they were also conservationists in several senses of the word.

The Mansion House loomed large at the top of the driveway. It had been sited with this approach in mind, Tessie could see. She still could not read any menace into that quaint and stately architecture. Any evil it contained had not yet penetrated the wood.

Santee led the way onto the front porch and opened the door. It was unlocked, a safe enough indulgence in this protected enclave. Shimizu halted Santee with a hand on his shoulder, bowed deferentially, then preceded him through the door. He stopped to look around, all but sniffing the air. Silence. If the house wasn't empty, it was doing its best to convey that impression.

They entered in single file. Parlor, living room, dining room, sun porch. All the trappings of a long bygone era of American prosperity. Tessie could see how each room had been subtly altered to meet the crasser needs of business entertaining. Too many telephones, their blank screens out of place next to chairs bearing antimacassars. Too many tables, most better suited for meetings than for assembling jigsaw puzzles. Nevertheless, the Edwardian patina shone through. *The Japanese must lap this stuff up.*

Santee checked the kitchen. Yes, the sink still bore droplets from water drawn recently. He produced an inventory of refrigerator and pantry contents. Food was still disappearing. Suddenly, the house felt less empty.

Santee headed for the sweeping stairs that led to the second floor. Again, Shimizu interposed himself. He advanced cautiously up the stairs, mind and body alert in ways that Tessie could appreciate far better than most people. No sounds beyond their own muted steps.

Tessie kept checking the corners of her mind. She was pretty sure she knew Arnie's mental touch by now. At least when she wasn't distracted. And she was determined not to be distracted on this important first foray into enemy territory. She locked eyes with Santee, saw calm assurance there. Not quite a boyish grin. *He's still OK.*

Shimizu's men were checking bedrooms, a bathroom off the second-floor corridor. An occasional indication of traffic, but nothing really recent. Tessie began to wonder what she could say she accomplished on this trip.

Then a whirring noise intruded on the silence. From outside. An electric golf cart approaching the Mansion House. Tessie and Shimizu exchanged concerned glances. Who would dare intrude on them at this critical time?

A barked order and Shimizu's men surrounded Santee. They made their way back down the main stairs with deliberate haste. Reached the bottom in time to see the front door thrust open. In walked Detectives Heatherington and Schwartz, the latter with gun drawn against he knew not what danger, *Jesus!*

The cordon tightened around Santee. Automatically, Tessie moved

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away from the cluster. No need to coordinate with Shimizu. They both knew what to do. As she hoped (and feared), the menacing gun followed her.

"Tessie Luellen Crocker?" Heatherington asked with at least as much pleasure as formality. "I have a warrant for your arrest." Idly, he swung a bag from one hand. Her bag, from the back seat of Santee's car. With the compromising pictures inside. *Merde. So much for leaving it in a safe place.* She kicked herself for being so careless.

"What's the meaning of this intrusion?" Santee tried to step out from behind his human shield. It resisted. He ended up in the incongruous position of peering out between the heads of two Pinkertons. But he hardly noticed. His sense of violated sanctity had driven out any thought of potential danger.

The pistol jerked toward Santee. Instantly, Shimizu stepped away in the direction opposite from Tessie. He barked a hard monosyllable, meaningless, but designed to command instant attention. The gun swung past Santee, heading for Shimizu.

My turn. Tessie stepped still farther away and coughed. That was the signal for one of the other Pinkertons to detach himself from Santee's cordon and move her way. The gun swung toward Tessie, then back to the Pinkerton.

Shimizu moved to encircle the cops from behind. Another Pinkerton broke away from Santee and moved toward Shimizu. Schwartz was definitely getting rattled. *Good.* They were almost in position for the standard maneuver against a man with a gun.

"Stand still, dammit. You! Get the hell out from behind me!" He was having real trouble deciding where to point the gun.

"What's the problem, Schwartz? Did you spot me jaywalking on your morning safety patrol?" Tessie was almost in position now. *Easy does it.* Her tone was decidedly nastier than called for as part of the diversion.

Then Shimizu, "We are Asahi Pinkertons. Why do you interfere with our work? Do you not honor your agreements with reputable companies?" He had the wind up too. This high-handed intrusion had pricked his well developed Japanese sense of pride and honor. The gun was everywhere now.

Heatherington waded into the fray. "Listen, Missy, We've got a complaint that you assaulted a local citizen outside the Holiday Inn last night. He synthed your pretty little face without a single glance at the hint books. Says you pulled a knife on him." He smiled a cop's your-ass-is-mine. Made an obscene suck-me with his lips.

Santee lurched against his human shield. "You're full of shit! That bastard assaulted her! I saw it myself." Tessie couldn't recall hearing him use vulgarity before.

"That's right. You're the boyfriend." Sneeringly. "Maybe we should haul you in as an accessory." The pistol swung Santee's way again, causing the guards to tighten their wall of flesh. Santee foolishly fought against his pro-

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tectors. He was clearly of a mind that bullets were never intended to come his way.

God! This is getting out of hand. Why is everybody so bent on fighting? Then a starburst went off in her head. *Arnie!*

They still weren't in optimum position, but what the hell. No more time to waste. Tessie barked the code phrase that began the maneuver. Knew as she did so that the most dangerous part had to go to her.

Success depended on keeping the gunman off balance until someone could get close enough to strike. First one attacker shouted, then another. Faster and faster. The pattern was apparently random, but not to the attackers. They had all practiced the rotation sequence until they could do it without thinking.

Just as well, for thought was becoming steadily less possible. However subtly Arnie may have begun, he was making a mental racket now. Santee and the two cops were cursing nonstop, a meaningless stream of billingsgate. The Pinkertons were worked up too, but the discipline of the drill still prevailed. It was working. They were closing in on Schwartz.

Tessie spared some attention from her role to paw through her mind. Yes, there was Arnie. She could separate his thrusting presence easily now that she knew where to look for it. She could even see behind those thrusts to the raw, adolescent anger that drove them. *Damn.* Almost missed her cue. Closer.

Then everything went to hell as Santee slipped around one of his guards and started toward Schwartz. The gun steadied on its new target. *No!* Tessie had to distract that gun. She had to stop Arnie. From the depths of her soul, she let the scream build and explode, as much mental as vocal.

"Get the hell out!" Then she launched herself at the gun.

The last time she had tangled with Schwartz was in the dark. She had surprise on her side then. *God, why did I ever give that damned thing back?* Now she faced a man keyed to the edge of violence. Remorselessly, she watched the barrel of the gun swing around, foreshorten, become nothing but a tiny black hole. The eye of death. Schwartz squeezed the trigger.

Shimizu bowled into him from behind as the gun went off. A rude force shoved Tessie's right arm into her side, throwing off her attack. But her left hand caught the wrist just as before. Twisted harder than ever. For good measure, she decided to break his arm this time. Holding the gun hand face up, she brought her right arm up from below in a vicious chop to hyper-extend the elbow.

Schwartz grunted and dropped the gun, but the arm didn't break. Instead, pain forked through her like summer lightning. Something was wrong with her right arm. She discarded the now unimportant wrist and dove for the gun. But Shimizu beat her to it. He had paused just long enough to take out Heatherington with a side kick to the kidney. Another guard hit Schwartz and he collapsed beside her.

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Tessie decided she liked it there on the floor. Pinkertons were doing all sorts of efficient things around her. She could rest for awhile. Someone with a voice like Randall's was calling her name. But the Pinkertons were busy hustling the intruder out the door. *Just as well. This is no place for civilians.* God, it was nice doing business with competent people.

Then she was being scooped up by a pair of amazingly strong arms. A salmon-colored uniform sleeve swept by in the grayness. *Why is it getting so dark?* Out the door and down the steps to the electric golf cart. Gently, she was placed on the cushioned rear seat. With what was left of her consciousness, she heard the grunting guards wrestle two heavy loads onto the back of the cart. No cushions there. Then they were off, Pinkertons trotting on each side of the loaded golf cart.

It would have been a nicer dream except for one sour note. She still reverberated with the shock and anger of Arnie's mind bruise. It was the first time anyone had ever struck back at him, and he had been all but defenseless. His parting gift to her was a vivid image. Tessie lay naked and bound at his feet. In each hand he held a broken broomstick, the ends jagged and ugly. She didn't have to be told what he intended to do with them.

She lost and regained consciousness several times throughout the brief trip. Once she thought she heard Randall calling her name again. He was more than a little frantic. She wanted to answer, to reassure him. But somehow the words didn't quite come out. It was a bad time to go all weak and feminine on him.

They emerged from the woods into barely controlled mayhem. Something had disrupted the quiet efficiency of Santee Castings. Workers were standing around outside buildings talking to each other. It was as if an explosion had gone off in some unknown quarter. People didn't know which way to look for rising smoke.

The Pinkertons headed straight for their own quarters. Shimizu was shouting orders in his rapid-fire Japanese. Pinkertons from their party were sprinting ahead of the cart. Tessie could hear answering calls from up ahead.

She fought to stay conscious. Knew better than to try to sit up. *How badly am I hurt?* At least she was aware now that she had been shot.

Then the cart stopped and a new bustle began. Tessie felt herself again being lifted with gentle strength. Carried through a door and deposited on something soft. Maybe a cot.

She heard the Pinkerton medic arrive and take charge. Heard Shimizu summarize the nature of the traumas he had observed. *Courts would love him*, Tessie mused. *Make a great eyewitness.* So the bullet had dug a groove up her right arm. The medic performed an instant triage, by Pinkerton rules. He examined Santee quickly, ignoring his protests; verified that the client was no more than shaken. Then he turned his full attention on Tessie. The cops could rot, for all he cared.

Tessie managed to open her eyes

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when the medic approached. Saw a lean Japanese in his mid-fifties, irrepressible kindness in his eyes. She forced a wan smile. Then, using the last bit of her strength, she raised her left hand. Made the three-finger battlefield gesture that said, *Give me a kicker.*

The medic frowned. "Moment please. I must check your wound, and test vital signs." She knew he was being sensible. A stimulant could easily kill her in her current condition. But she had to get back to work. Her clients needed her.

She tried to nod. Couldn't quite. So she made three fives with her left hand, then repeated the original gesture.

He frowned again, but said, "OK, in fifteen minutes. But first we check you out." This time Tessie managed a nod. Now she could rest for a few minutes.

She went out like a light.

It was peaceful there at the bottom of the pool, but she was running short of air. Tessie let herself float upward toward the light. She broke the surface, tried to flail her arms. One arm seemed to be tied down. Someone grabbed the other.

She opened her eyes to find Randall firmly confining her wandering left arm. He didn't have to work hard at the job—she was weak as a kitten. She gave up the fight, looked around. Another one of those cozy rooms in the executive suites, quickly turned into a private hospital room. She was wearing her cotton nightie once again, with the "TLC" over her heart. Her upper right arm was bandaged economically, the lower arm strapped firmly across her midriff.

"Welcome back. You can thank Edith for the change of clothes and a general cleanup. She was adamant that you not wake up looking like you did when they brought you in."

Randall was definitely showing signs of exhaustion. But he was holding up, Tessie could see. *He's in better shape than you are right now,* she reminded herself. He treated her to his boyish smile.

"Before I say anything else, let me discharge my obligation. Dr. Ogawa sends his deepest apologies. The fifteen minutes you requested turned into three hours."

Tight-lipped frown. "Actually, you can blame me for most of that delay. If I'd had my way, you'd be in City Hospital right now with doctors and nurses climbing all over you. You've suffered a major trauma and you're running on two units of plastic blood. That's not as good as the real stuff, you know. You need bed rest, badly, and better treatment for that wound.

"Shimizu-san insists, however, that you requested otherwise. He wouldn't let us evacuate you."

"Shimizu-san is correct." The words came out in a croak. She cleared her throat, continued. "You can tell Dr. Ogawa that I'm ready for my kicker now." Her arm hurt like hell, and she was still weak. But she figured she could handle the drug now. And she had to get moving.

"If that's what you call a combat stimulant, then he just gave it to you a few minutes ago. Otherwise, you'd

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still be asleep, as you should be." Randall obviously did not approve of the liberties that she was taking with her health. Nor did it help that the Pinkertons were willing accessories. *Tough.*

Tessie performed a quick internal audit. If she'd felt this good without the drug working, she'd have been a lot happier. Now she had to discount the growing sense of vitality that coursed through her veins. *Not too good. Maybe six hours before I really collapse.*

She tried to sit up. Her head swam. Not yet. Better talk for awhile. *Can't let Randall know how bad I feel.*

"So, what's new?" The tone was not as light as she wanted. It would have to do.

"Well, let's see. We closed the plant down. Sent everybody home and canceled the second shift. Arnie's mental scream seemed to disturb everyone on the grounds. Even the cops parked out on the street felt something. We haven't attempted to issue any sort of explanation."

"I hit back at him pretty hard. I suspect it was his reaction to the pain that really carried."

Randall looked startled. "*You* hit *him?* But Arnie can only send, not receive."

"Oh for God's sake, grow up." Tessie's weakness made her more petulant, less tolerant. "A company full of engineers and you can't see the obvious. Of course Arnie can receive. How the hell else can he know what works and what doesn't? Don't you know anything about feedback?"

She could see the hurt look in Randall's eyes. She had caught him being naive yet again. She softened her reproach.

"Look, Arnie has had years to work on all of you. He's been careful to dampen your curiosity. I figured that out when you first told me you'd done no experiments with him. Here you have a major scientific phenomenon on your hands, not to mention an important economic asset, and you've done nothing to learn its extent."

She shook her head tiredly. "I also guessed from the start that he could read minds to some degree. Then, when he attacked us last night, I knew for sure. As soon as I came fully awake, he stopped trying to break through the window screen. He was aware of my mental activity before I made a sound."

It was Randall's turn to shake his head. "Well, I guess we should be grateful that he only traffics in emotions." He caught himself. "Or does he?"

"Much better. You're catching on. Care to distinguish for me where emotions leave off and thoughts begin? It's a pretty fuzzy distinction. My experience so far with Arnie is that he seldom projects very precise thoughts—mostly emotions as you're accustomed to believe. But sometimes what he sends is sharp enough to convey a picture, or something resembling words. I have to believe that he can receive about the same level of detail." She decided not to tell Randall about the ugly image that Arnie left her as a parting gift.

Randall sat silent for a long mo-

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ment, evidently absorbing the implications. Then, "You saved my life."

"Comes with the job."

"The hell it does. At least, that's not what we paid you to do. You're supposed to be going after Arnie. That's a hard enough job. I don't want you risking your life to save me from my own stupidity." He tried to sound stern, failed miserably. "Not that I'm ungrateful, mind you."

"Look, I had a lot of reasons for doing what I did up there. For one thing, I struck a deal with the Pinkertons. I help them guard you and the others and they help me do my job. For another, I interpret my obligation as an assassin a little more broadly than most." A crass understatement, that. But close enough to the truth.

"And for another thing, I really care about you. I couldn't live with myself if I stood by and let you get hurt."

For an answer, Randall bent over and kissed her long and hard. The kicker was really cutting in now. She was ready to have sex with him.

Fool that she was, she pushed him away. "I really have to get moving. Help me up." Randall obviously had other priorities as well, but he complied. This time, Tessie was able to sit up without blacking out. *Better living through chemistry.*

Randall was helping her into a pair of socks—makeshift slippers—when the door opened. Detectives Heatherington and Schwartz stood there, both definitely the worse for wear. The ride down on the golf cart probably did them as much damage as the scuffle that preceded it. Two Pinkertons stood right behind them, ready to intervene if they got nasty again. At least Schwartz hadn't yet got his gun back. His arm was in a sling.

Randall scowled at the intrusion, drew himself up to deliver a major blast. Heatherington stopped him with a gesture that was remarkably placating, coming from him.

"I'm really sorry to intrude, but I'm under serious time pressure. Headquarters is preparing to make a major raid on Santee Castings, unless I stop them very soon." He approached Tessie until a Pinkerton hand on his shoulder halted him and looked at her piercingly.

"Ms. Crocker, I don't know what the hell happened up at that house, but I don't mind saying it scared the crap out of me. Something tells me that you do know what happened, and that you've been brought here to deal with it." He wiped his hands on his pants. "If you can't handle it, I don't expect the Fifth Precinct will do any better."

He glanced at Santee, back at the Pinkertons. "Now, I don't know what you're allowed to say, but you have to tell me something. Please give me enough ammunition to stop this raid. Otherwise, I don't want to think about the damage that will follow."

Tessie looked him over. Probably a good cop, except for that mean streak. *Comes with the territory, I'm afraid. It's tough being a cop.* She decided to bargain a little.

"Tell me who sent you to hassle me." He looked hopeless. "You were under orders to hassle me, weren't you?"

"Yes. But the word came from

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downtown. I don't know where it originated. Honest."

"And the warrant for my arrest?"

"One of your common or garden variety street hoodlums. We knew the charge was trumped up." Then, "I'll make it go away. Trust me."

That was probably all she could get out of Heatherington right now.

"OK, here's the situation. There's a crazy guy holed up at the Mansion House on the hill. We have reason to believe he's got a peculiar talent, an ability to influence people's emotions. You got a dose of that. We also have reason to believe he's responsible for the recent rash of attacks on house women from nearby hotels. Seems he's learned to use his persuasive abilities to indulge some rather nasty sexual appetites. He may already have progressed to murder."

That was all Heatherington needed to know.

"My plan is to go up there and dig him out tonight." She ignored the startled look from Santee. "Yes, I've been hired to kill him. Nevertheless, I'll do everything I can to bring him out alive, so he can stand trial for what he's done. But to be honest with you, I don't expect that I'll succeed." She left ambiguous what her failure modes might be, but she knew they could guess. *Either Arnie dies tonight, or I do.*

Heatherington nodded, "I can live with that. But it's going to be a tall order explaining the situation to headquarters."

"I'm asking you to make it an even taller order. We have an incredible phenomenon on our hands here. Even if this man dies, we now know that the American gene pool can produce people with a valuable new talent. It is imperative that we keep it a secret until we can map it and develop it. Think of it as a matter of national economic security."

That was dangerous talk. Tessie was revealing much of the philosophy of the neo-samurai, who preferred to do their work in secret. But the situation had grown critical.

A shrug. "OK, I'll try." Then, with a glance to the Pinkertons behind him, "But I don't give your secret much of a lifetime. I'd say it'll be in Osaka with the morning stock quotations."

Anger flared, but Tessie quickly stuffed it. Now was not the time to beat up on Heatherington. Still, she owed it to her friends to defend them. "Don't weigh lightly the discretion of the Asahi Pinkertons," was all she said. But she knew it was enough. And her words would be repeated over and over among the ranks guarding Santee Castings.

Heatherington turned to leave. "One more thing," she said. He paused, looked back at Tessie. "How did you manage to get onto the grounds and find us?" She was sure the Pinkertons would have at least slowed the cops down.

He blinked. "No big deal. One of the bigwigs was at the front gate when we arrived. He passed us through himself. Even loaned us the golf cart and told us where to find you. Nice guy."

Tessie and Santee exchanged glances. "Could that have been Giles Edwards?" Santee.

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"Yeah, that sounds right. Nice guy." He left. The Pinkertons followed, discreetly closing the door behind them.

Randall muttered something obscene. "Looks like I've got some serious talking to do with Giles."

"For what good it will do. But I suppose you have to try." She tried to stand up, winced as her arm flexed. Sat back down.

"And where the hell do you think you're going?"

"You heard what I said. I've got to go find Shimizu-san, then take a walk back up that hill." She hoped he wasn't going to go all silly and protective on her again. She need not have worried.

"Yes, I know what you have to do. But can't it wait? You haven't got much strength left right now. And Arnie can't go anywhere."

Tessie knew better than to tell him the full consequences of taking a kicker. She would pay compound interest over the next week for these few precious hours of activity. She had to act now.

"He's been pretty successful at going wherever he pleases, so far. And right now he's angry enough to do damn near anything. Besides, the cops aren't going anywhere, either. I don't think that Heatherington can keep them at bay indefinitely."

Randall bowed to the inevitable. She tried to encourage him.

"Look, right now Arnie's the one who's off balance, for a change. I need to hit him before he gathers his wits again. Besides, battling him is as much a test of wills as it is of strength. I'm gambling that my greater mental discipline can hold its own against his raw, untrained talent." She didn't say what she would do when she got close enough to make the struggle physical. Right now, she didn't know.

She stood up again, was careful not to wince. It was easier—she felt almost normal. Pretty soon, she'd have to deal with the edgy euphoria of the drug as it began to peak.

"And now, if you'll be so kind as to leave, I have to change into my work clothes. If you're here when I get undressed, I might not want to get dressed again for awhile."

The mixed note of levity and lust worked its magic. Randall kissed her briefly but passionately, hugged her gently but perhaps a little too long, then let himself out. Tessie breathed a very audible sigh of relief. She wasn't kidding about wanting to be undressed for an hour or two with Randall Santee. A kicker was a notorious aphrodisiac. That energy could not be diverted, however, from her most pressing goal.

Her Board Meeting suit was hopeless. What the bullet hadn't torn up, and her blood permanently stained, the medic's knife had finished. They had cut her out of her bra and slip as well, more expensive rags. *No matter.* She dug through her bag with her one good hand.

Her stalking outfit of choice was a black jump suit and equally black running shoes. A little black body paint and a stocking cap completed the commando look, when necessary. Right now she'd settle for just the jump suit. But that was not to be. That bandaged arm would never stuff into

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that sleeve. She balefully considered chopping the sleeve to meet the current need. *No way.* It may have been a false economy, but she could not bring herself to inflict any more damage to her wardrobe. And stealth was not likely to help in this situation, anyway.

A little further digging revealed a pair of royal blue pedal pushers and a yellow tank top, both old and tacky. Normally, she reserved these for visits to health clubs where she didn't want to meet attractive men. The kind of guys who hit on her in that getup were easy to say no to. It would have to do.

She began to unstrap her injured arm and immediately regretted asking Randall to leave. The contortions would have tested her dexterity at the best of times. When each ill-considered twist brought a stab of pain, it was all the harder. Somehow, she managed to release the arm and extricate herself from the nightie. She stood there in underpants and socks, inspecting what she could see.

Edith had cleaned her up well. Her left nipple was sore, probably from her reckless dive after the gun. A bruise or two around the ribs. The arm hurt more floating free, but she could deal with the pain now. She could not afford to have one arm out of commission, however weak it might be.

A discreet door led into another well appointed bathroom. She emptied her bladder, washed her face and hands.

She worked her way into the tank top, wrenched it around until her breasts looked more or less symmetric, didn't feel pinched. They stood out like overripe grapefruit. She shimmied into the pants, stepped into the black shoes. Found a rubber band and managed a one-handed pony tail with it. She looked herself over in the mirror.

Jesus. I look like a comic book super heroine. Then, *Wish I felt like one.*

Time to act competent again. She felt like a million dollars. After taxes. Before the Deflation. *Yuk.*

Shimizu was waiting outside the door, along with a few of their fellow participants in the abortive raid. They sprang to attention when she appeared, both deference and joy in their faces. *And they say the Japanese are inscrutable.* She exchanged a flurry of suitable bows, teeth clenched at the effect of these maneuvers on her injured arm.

That done, she came right to the point. Addressing the lieutenant in formal Japanese, she intoned, "Shimizu-san, I would share a cup of tea and an hour of your time." Then she held her breath.

Astonishment replaced cordiality, despite his well-trained reserve. The other Pinkertons went into neutral. They all recognized the telltale triplet, *share/tea/hour,* if only as part of the legend of the Daughters of the Winds. They knew the profound implications of the offer, knew it to be just as much a plea. Knew the honor in it, and the danger. Everyone waited to see what Shimizu would do.

But he was neo-samurai. He could no more pass up this offer than he

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could shirk his duty to his men. He bowed and made the formal reply. "The honor is mine. My time shall ever be yours." There was more truth in the latter part of the formula than either wanted to admit.

Then, more practically, he said, "Please allow me a few minutes to prepare. I shall send for you." And he bowed his way out.

Tessie retreated to her makeshift hospital room. Had the drug not ruled so much of her body, she would have been shivering with relief. And fear. She began working in earnest on Stillness of the Body. Such a fragile platform to support Stillness of the Mind.

By the time the knock on the door summoned her, she was moderately calm. She followed the silent Pinkerton down a corridor, through to another building, down another short corridor. Shimizu-san was waiting in the small windowless room, kneeling before a low table. A lone candle lit the room.

She entered and knelt opposite him. The door quietly closed behind. Nothing short of an armed insurrection would disturb them for the coming hour. Their guard would see to that.

It was Tessie's party. She had called it. She had been through the process before. It was up to her to get the pacing right, to cover all the bases. Shimizu-san might know in general outline what was coming, but the details were all new to him.

Tessie took in the contents of the low table. Someone had magically turned up a Noritake tea set, an excellent green tea, sweet wafers from Kyoto. The presentation was austere, deftly asymmetric, thoughtful. *What a delightful last meal.*

Tessie inquired of the health of Shimizu-san, of the disposition of his family. Learned he had a wife and daughter in Osaka. His wife taught ceramic painting in the neighborhood, was highly respected. The daughter was doing well in juku, thank you, looked to do well in her exams.

Shimizu-san asked of Tessie's family. Learned of her mother and sister back in Virginia. Accepted her vague statements about them with tact and grace.

A part of Tessie wanted to scream and rush forward, to get all these silly pleasantries out of the way before the brief hour evaporated. But the wiser part of her knew the importance of this phase, and each one that followed. You do not entrust the greatest secrets of your life to someone you don't know. The quickest way to know a person is to know that person's immediate family. Every step of the process, even the hour time limit, served to impart the greatest information, create the strongest bond, with the greatest economy of time.

They progressed to the tea ceremony. A Japanese traditionalist might take exception to a number of details altered or rushed. Tessie understood how unimportant those details could be. She had once performed this process with tea bags in tepid water, drinking out of paper cups. Rats chittered just beyond the candle light in the sewer where she and her companion huddled. That one died the

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next day, rather horribly, and Tessie spent most of a year discharging her obligation to a woman she had known for but a few days.

Truly immortal are the Daughters of the Winds.

Then it was time for the situation summary. Tessie briefly reviewed everything she knew of the complex of events at Santee Castings. She spoke of her well-founded conjectures, her surmises, her fears—labeling each for what it was.

Shimizu-san asked several penetrating questions. He volunteered a few details that pleased Tessie more than they surprised her, since they supported her conjectures. He went over in detail the actions he should follow given several likely contingencies. They soon agreed on how best to serve their mutual clients, and their fellow neo-samurai, in that order.

Now it was time to get personal. Since Tessie instigated the meeting, Shimizu-san got to go first. As she had expected, he had given careful thought to what obligations should be laid at her feet. Like any good soldier, he had already made adequate arrangements for the settlement of his overt financial obligations. What was left were the things undone over which he would agonize at the moment of his death.

There was a bastard son in Okinawa, being raised by a woman he had never thought to marry. Both were provided for well enough, but how to get the boy into a Tokyo university? Tessie memorized the names of three influential professors, and the words she was to say to each. That was the extent of the effort Shimizu-san expected in this dimension. (Tessie mentally vowed to do more.)

There was a man in Honshu who had shamed the younger sister of Shimizu-san. It was too ugly an act to describe, until now. The man needed to be taught that such acts do not go unavenged. Shimizu-san suggested several responses, mostly legal, that would bring the man the public humiliation he deserved. (Tessie mentally vowed to do *much* more.)

And that was the list. Rather short for the circles that Tessie normally traveled in. But it was of mortal importance to Shimizu-san. She gave the formal response, "In the event of your death, this I will do as if I were you."

Then it was Tessie's turn. First she recited the list she had inherited from others. It too was mercifully short —Tessie worked hard at keeping it pruned. Then she added her own entries. Like Shimizu-san, she avoided matters of finance as much as possible. But she had to describe her elder sister's plight, and the plans that remained incomplete for obtaining her financial freedom. If Tessie's life insurance policy paid off as it should, the problem was solved, along with the care of her Mama. But both knew well how quick such companies were to renege, particularly with guards and assassins. She could only suggest a few possible courses of action.

Now for the really hard part. Tessie described the roads he must take out of Winchester, Virginia. Turn off the main highway here, leave the blacktop behind at this general store. Look for the tiny house with the screen

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porch just past the wooden bridge. Be sure the gray-haired woman is indeed Lurline Crocker. Then speak these words to her and to her alone.

Because she was neo-samurai, Tessie said each word with steely clarity. There must be no error, no deviation. But because she was still a country girl, tears streamed down her face. She could see Mama sitting ramrod straight before this strange Japanese, who recited intimacies rarely spoken aloud even within the family. If Shimizu-san carried out that duty, it would mean that Tessie was beyond speaking for herself. Ever. Her voice quavered as she spoke from beyond death—of apology, and of forgiveness, and of love.

Truly immortal are the Daughters of the Winds.

Tessie went silent. She waited for the formal words, "In the event of your death, this I will do as if I were you." They bowed to each other, and it was over. *Fifty-nine minutes, by the clock.*

The guard spattered something at Shimizu as they emerged. He gave a brief reply, and the man left on the double. Shimizu led the way through the strange corridors. They emerged into late evening twilight, near where their little troupe had started off just hours earlier. Randall was there, and Edith, and the two detectives. Moreover, every available Pinkerton was lined up in a double row, ready to pay homage to their Tessie-san.

Tessie was working hard on control. She could spare only a squeeze of the hand to Edith and to Randall. She knew they would understand. She nodded to the detectives, started down between the rows of waiting Pinkertons. *Stay focused, Tessie.*

Behind her, she could hear Schwartz mutter just a bit too loud. "Nice to have the boss man order up a pretty send-off, ain't it?"

More clearly, she could hear Heatherington's biting reply. "Ron, sometimes you can be a real asshole. Shimizu didn't order them to do this. He gave them permission."

At the end of the rows waited Shimizu, who had deftly rushed ahead to meet her one last time. They stood there face to face, fellow warriors in a secret campaign, determined to rescue two mighty but struggling nations from their mutual excesses. Two proud soldiers reduced to working as mercenaries, to pay the rent. Two old friends who had just met earlier that day.

Because she was neo-samurai, Shimizu offered her no last words of encouragement, no idle wishes. But because she was still a country girl, he kissed her on the cheek.

Tessie walked into deepening darkness. The night chill bit at her bare shoulders and unbandaged arm. She knew the walk up the hill would soon warm her up. Besides, the drug had built to its peak effect. It would supercharge her metabolism for at least another two hours.

She was deep into Stillness of the Body now, but Stillness of the Mind remained elusive. Her thoughts kept darting about, her emotions churned. Was it really only twenty-four hours ago that she first met Randall Santee?

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So much had happened since, with so little time to absorb it all.

She fully expected to die this night, and she did not want to. However full her life might be by the standards of many others, twenty-five years was not long enough to prepare for eternity. Not for Tessie Luellen Crocker. Not for the little girl who whimpered and struggled within.

Then Tessie got mad at herself. *What's your problem, girl?* She had faced death often enough before. Whatever the odds, she would keep fighting until every last gram of strength and will were worn away. That was what life was about, however shortened or protracted. *Death is just nature's way of telling you it's time to slow down.*

More whistling in the dark. Tessie was scared. She dug for the root fear, quickly found it. As always, it was some irrational thing that she least expected. She did not fear what Arnie might do to her mind or body—that was simply a mortal battle with a winner and a loser. No, the real thing was just a silly romantic notion. She was in love with Randall Santee and she didn't want to die so soon after meeting him.

She was too kind to herself to sneer at the thought, futile though it was. This was not a man likely to marry an assassin, one hardly more than half his age at that. This was not a man who could long tolerate Tessie and her dark moods. No, this was a man who would want a stay-at-home wife, charming at parties, good with their children. *Children. Aye, there's the rub.* How could she call what she felt love, under the circumstances?

Gently but firmly, Tessie stuffed the dream into a little used corner of her mind. It had plenty of company there. With that simple act of mental discipline, she banished the fear that nibbled away at her self-control. She began working in earnest on Stillness of the Mind.

By the time she crested the hill, she was in full control. No wasted motions, not a stray thought. She walked quietly, serenely through the front door of the Mansion House, still open after the rushed evacuation earlier that day. Her nostrils flared at the smell of blood. Her blood, still drying in spots on the entryway floor. But not even that small horror left more than a ripple on the smooth ocean that was Tessie's mind.

She drifted through rooms briefly visited, now darkened, but still firmly imprinted on her memory. She extended her good hand, and there was the push plate on the swinging door into the kitchen, right on schedule. Silently, she pushed her way through, helped the door swing softly closed behind her. She advanced to the middle of the kitchen, lowered herself gently to the floor. Assumed the lotus position. Waited.

If Arnie were really sensitive, he would know she was there already. He would be laughing secretly at her silly attempts at evasion. He would be sneaking up on her even now, ready to hit her high and low. Or something worse. If Arnie were really in control, he would wait her out. She could stretch the kicker out an extra two or three hours with her now lowered

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metabolism. Sooner or later she would fold, however, and Arnie would have his way with her.

But Tessie was willing to bet that she knew her quarry by now. Arnie had never had to stretch his native talent, never had to discipline it. For that matter, he had never had to stretch himself in any way, nor sit still for any real discipline in any dimension. He could make people do his bidding so easily. Hard work, and restraint, were for others. No, Arnie was an overgrown child, an early adolescent at best. She was willing to bet her life on it.

Half an hour after Tessie began her serene vigil, the bet began to pay off. She picked up his mumbling thoughts at the edges of his mind. He was angry, and vengeful, and completely self-absorbed. *Adolescent, indeed,* the thought stirred deep in the ocean that was Tessie's mind. It vanished without a trace, undetected.

The mumbling came closer, grew. He was busy at some task, but she couldn't tell just what. It involved hauling things about, and dumping, and arranging. But he worked mechanically, his mind darting off in all directions. Past wrongs, imminent revenge, future pleasures—all bounced like Pachinko balls through his untidy consciousness. He was very close now, but Tessie still couldn't tell where. Closer.

Then a sudden shock. Arnie stopped what he was doing, pawed mental air. He had finally detected Tessie's presence. Incredulously, he felt out the shores of that glassy ocean. Poked at it. Nothing. Jabbed at it. Ripples formed, but soon died out.

Angrily, he slammed her with all his mental might. The surface of her mind churned, settled out, went glassy calm again. The irresistible force had finally met its first immovable object.

Tessie had made her point. Arnie was not as much in command of her as he was accustomed. But that was no more than an opening move in the battle. She would have to come out to engage him. She would have to lower that impressive shield. Slowly, she began doing just that.

Arnie watched and bided his time. When he felt the shield was low enough, he struck again. Then, like a persistent door-to-door salesman, he stuck a mental foot in the door. Tessie could no longer raise her shield and hide from him. But to his surprise, Tessie grabbed that mental foot and held on tight. She couldn't hide and he couldn't run.

They remained thus for a timeless time, checking each other out. Then, *So you're another one.* The thought that formed in Tessie's mind was preverbal, but the translation was unambiguous. The words startled her. *What does he mean by that?*

Before she could seek an answer, Arnie laid into her with all his will. Anger washed over her in wave after wave. The little girl within ran and hid under the bed. Here was a *real* bogey man. Through it all, Tessie held on for dear life. And she held onto that metaphorical foot in the door. She would not give him the option of falling back to regroup.

But the anger was indeed over-

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whelming. Arnie poured into her all his hatred of women, all his fear of abandonment and pain of past rejections. He was an adolescent on a rampage, beyond a child in strength, well short of an adult in restraint. She had to find a counter, and fast.

Her instinct, as always, was to counter chaos with discipline. If Arnie was going to hit her with unfocused anger, she would show him what focused anger could do. Hurriedly, she pawed through her locker of memories, chose one that was sharp and hurtful. And brimming over with pointed anger. With a will at least as desperate as Arnie's, she descended into memory. And dragged him, willy nilly, down with her.

Mama was fixing to go out, and Tessie was desperate to stop her. "Mama, you promised you'd stay home tonight. You *promised.*" Tessie sat at the worn Formica kitchen table, watching her mother fuss about with last minute preparations for her outing. Cigarettes, car keys, the tube of lipstick she had just spent five minutes applying.

"I know I did, Tessie Lu. I know I did." Mama was half contrite, half annoyed at being challenged. "But Emma Jean's called in 'cause her Bobby's got the measles bad tonight and she can't get no baby sitter 'cause of what she said to Sandy and her friends when she caught 'em last week, and you know how much I need cash register time."

"Mama, you ain't gonna get no promotion so long as Emma Jean keeps lettin' Mr. Sanders feel her up out behind the dumpster. You said so yourself just yesterday."

Mama looked stern. "Now you watch your mouth, young lady. Ain't no thirteen-year-old should talk trash like that, 'specially not to her mother." Mama was happy to divert the subject from her own equivocal behavior, however much she had to strain to be pious.

Tessie pushed her hair back from her face. The family knew she was near the edge when she fell back on that nervous habit. But Mama tuned it out. She was intent on leaving the house, and probably for much the same reason Tessie wanted her to stay.

In less than an hour, Justice Symes would be coming through that kitchen door. He would be liquored up good, this being payday and Justice being near the edge himself. For three months now, he had shared Mama's bed, and her dinner table. He had it pretty good, Tessie reckoned. Mama still was something of a looker and not a half bad cook. But it was clear that Justice wanted more. Living with two teenage girls, one well developed, one nicely nubile, was driving him more than a little crazy.

Tessie and Emily tried to be careful, but Justice was sly if he wasn't half smart. He kept breaking the hook on the bathroom door so they couldn't lock him out. Somehow, he always needed to take a pee when one of the girls was in the shower. He'd linger by the toilet, gently fondling himself, studying the fleshy shapes through the translucent shower curtain. The girls knew better

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than to come out, always outlasting him. But that just let him piss and moan about the water and gas bills (not that he paid them), and look for other ways to catch them naked.

Tessie had taken to wearing oversize clothes, much too heavy for the muggy Virginia summer. But Emily just wouldn't quit. She loved the effect she had on boys. Seemed oblivious to the stronger effect she had on men. And Justice was getting hornier and braver by the week. Mama just couldn't go out tonight.

Mama picked up the car keys with a shake of finality. "Now you be a good girl and get on up to bed." She gave Tessie a peck on the cheek without meeting her eye. "And don't you fret, Tessie Lu. Your daddy'll be home soon and look after you."

"He's *not* my daddy. He's just your boyfriend. My daddy run off 'cause you can't seem to get enough boyfriends to make you happy." Tessie knew she was overstepping the bounds with that nasty remark, but she was well beyond desperation by now. She had to do *something* to change the inexorable future that was unfolding.

Mama raised her hand to slap, anger boiling in her eyes. But for some reason she stopped. Instead, she began to cry. It was the self-absorbed crying of the lonely child.

"Oh Tessie, child. Tessie, please. I know Justice ain't much, but he's all I got. Please don't do nothin' to make him go off. *Please.*"

Tessie said nothing. Her mother made an ineffectual gesture, sniffed loudly, and banged out the screen door. The old Honda started with an unnecessary roar, spat gravel clawing up onto the blacktop into town.

Dejectedly, Tessie climbed the stairs. Emily looked out from behind her door at the end of the short hallway. "I heard Mama leaving." Tessie could only nod. A moment's silence. "It'll be OK, Tessie Lu. Don't you fret none." And she closed her bedroom door.

Tessie entered her own bedroom, hardly more than an enlarged garret, but hers alone. She closed the door, contemplated wedging the lone chair up against the knob. Decided against it. *Just let that man try for me tonight. I'll show them all who ought to be fretting.* But she knew, in her heart of hearts, that she dreaded the thought of having to deal with Justice Symes, tonight or any night.

An hour went by. Tessie lay fully clothed atop the bedspread, wide awake. *He's late. Maybe he won't come home tonight.* But the thought summoned up the devil. She heard his big Nissan come down the road, pull off the blacktop in front of the house, stop. A creaking of hot metal relaxing. A crunch of boots on gravel. Car door slam. More crunching. Kitchen door slam. *Daddy is home.*

Five minutes passed. Justice must be finishing off the last beer in the fridge. Yes, there was his uneven tread on the stairs. A brief stumble and recovery. Justice was drunker than ever.

Tessie hung suspended in fear as the uneven steps came closer. Paused just outside her door. She watched in breathless anticipation for the door-

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knob to turn. Felt a thrill of horror as it twitched. Felt a different kind of thrill when the knob settled back, unturned. The footsteps went down the hall to Emily's room.

"Don't you fret," her sister had said. That meant she could handle the situation. It meant that Tessie didn't have to feel guilty when Justice passed her by for Emily. It meant that Tessie could hide in her room and tune out the noises that were beginning to come from next door. *The hell it did.*

They began with a gentle murmur of voices. Justice was speaking softly and persuasively to Emily. Her replies were guarded, but not unkind. Tessie heard the heavy creak of bedsprings as Justice moved in on his quarry. He was still persuading. Emily was still trying to deflect him with gentle persistence.

Then a louder voice, "No, please don't do that. Please." His tone was more urgent now, pleading. "No, please." A squeak and a louder creak. Silence. Then the loud crack of flesh against flesh. A backhand to the face. Emily began to sob. "Please, oh please."

Tessie got up from the bed, not entirely sure what she was doing. She opened the door to her room, walked downstairs to the kitchen. She didn't rush. Equally, she made no attempt to be silent. The kitchen drawer held a paltry assortment of knives. Tessie calmly selected the paring knife with the serrated edge, her knife of choice for most kitchen chores. This time, it seemed she had chosen it as part of a plan long laid that was only now unfolding in her consciousness.

She walked back up the stairs, down the hall. Opened the door that Justice had thought to close behind himself. Emily's reading light was on, a Harlequin Romance shoved aside on the night stand. She lay naked and open on the bed, sobbing and motionless, her beautiful young breasts stabbing toward the ceiling. Her summer nightie lay torn and discarded in a corner. Tessie could see the harsh line on her sister's neck where the hem had resisted tearing and dug into otherwise flawless flesh. She saw the red welt already raised on Emily's cheek.

Justice had kicked his boots and pants off. He lay across the foot of the bed on one elbow. His free hand was working up an erection. Not an easy task, drunk as he was, but he was making progress. And Emily wasn't going anywhere.

Preoccupied and drunk, Justice was slow to react to the opening door. By the time he thought to look around, Tessie was on him. She grabbed a fistful of greasy hair, pulled his head back, and pressed the knife against his throat. Hard.

"What the f—" He choked on the obscenity as Tessie drew the knife half a centimeter along his neck. The serrations bit, drew blood. He stank of rotting teeth and stale beer.

"You just listen to me, Justice Symes." Tessie's voice was so calm that even Emily looked at her funny, forgot her sobbing. "You're three-fourths drunk and half asleep. But you don't wanna go to sleep in this house tonight. Not tonight or any night. Wanna know why?" the head came

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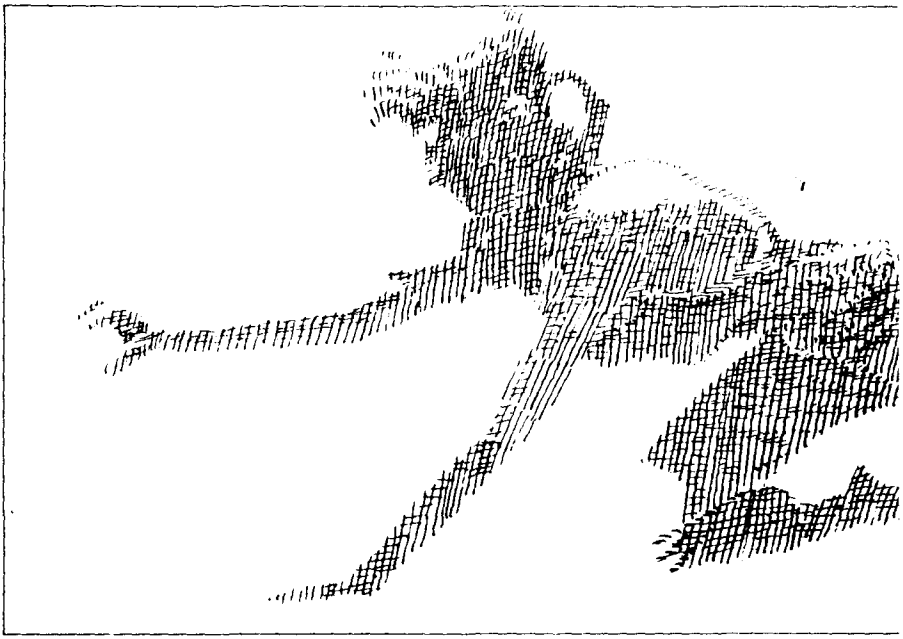

back another centimeter.

"Unh," was all that came out.

"Why is 'cause next time I catch you asleep I'm gonna cut you where it hurts the most. Me, Tessie Crocker, that's who. I'm gonna cut you so you'll wanna but you can't. I'm gonna cut you good."

Suddenly, his free hand lunged toward Tessie. She dodged it easily, twisting his hair savagely. Drew a second line with the knife. "You little bitch." Justice was always a slow one to comprehend a situation. Tessie was patient in her focused savagery.

"Your life just got simpler, Justice. From now on, you only gotta think about two things. Every time you fall asleep, you gotta think, 'Where's Tessie Crocker tonight?' Every time you wake up, you gotta think, 'How'm I gonna pee today?' Real simple. You got that?"

He was getting it.

"Now, you can waste time tryin' to beat the crap out of me. But you best not. If you don't kill me dead, you still got the same problem. You're gonna have to sleep sooner or later and Tessie Crocker's gonna be lookin' for you. With a knife."

Contemptuously, she let him go. Stood there looking at him as he rubbed his neck. Slowly, he raised himself off the bed. Towered over her, looking down. Very slowly, not taking his eyes off her, he bent down and picked up his boots and pants. Anything resembling an erection was now a thing of the past. Giving Tessie the widest berth permissible in the small bedroom, he left.

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Tessie sat numbly on the edge of the bed. Emily grabbed her hand and held on tight. They could hear Justice stumbling about in Mama's bedroom at the other end of the hall, slamming drawers, pulling clothes off of hangers. Then he was down the stairs, out the screen door. He flooded the engine twice getting the Nissan started. Finally, he was gone.

"Tessie Lu, what have you done, girl?" Emily was as much awestruck as scared. They clung to each other and cried half the night away. And between them hung unspoken the most frightening question of all. *What's Mama gonna do?*

Tessie let the memory unravel, groped for her bearings. The waves of anger had subsided. She felt for the mental foot, found she still had a firm grip on it. Worked her way along it. Found a subdued Arnie at the other end. *That's more like it.*

Now if only she could locate him. He was not upstairs, she was pretty sure. All that original bustle would have certainly made noises on the wooden flooring. She doubted he was on the ground floor either, for much the same reason. Outside? In some basement? Too bad their earlier expedition had been interrupted so soon. She kicked herself for not quizzing Randall about the layout of the Mansion House.

Tessie was beginning to cramp up. For all her years of meditation, she had come late to the Eastern arts. The lotus position had its advantages in focusing the higher faculties, but for a Virginia girl it made her butt sore. Maybe she should get moving.

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Not yet. Arnie was licking his wounds, but he was a long way from giving up. She sensed a stirring. He was on the move again. She probed. Found an active attempt to blur and block. *What's he hiding?* She probed harder.

Smells. Kerosene. A whiff of corruption. She gagged. *Wow! Is he making that up?* She couldn't tell. Dragging a heavy load. Cold. No images. She was more confused than ever.

Well, let's stick with what seems to work. She rifled through her storehouse of memories again. Something that really packs a punch. *Hmm. How about anger and despair? That's a heady mixture.* She made her choice.

Now to get Arnie's attention. She performed the mental equivalent of jabbing him in the ribs. He tried to ignore her. Made a squishy ball of contempt and derision, lobbed it his way. Angrily, he swatted at it. That was better. This time she folded in a little lust for seasoning, plus an image of herself in her tight clothing. That did it. He lunged back and she grabbed a double fistful of—whatever.

Here we go again, she projected cheerfully and dragged him down into memory once more. She was rewarded with a fleeting waft of vertigo and fear before they both plunged once more into her past.

It was a luscious boudoir. Silk wallpaper, thick carpeting, and fine furniture from half a dozen countries. A cozy fireplace to lie in front of and a bed you could get lost in. Midway between the two, on a lambskin rug, Emily was playing host to Tessie. Her older sister was regaling her with tales of the great men of Washington and Tokyo, all reduced to their basest drives when Emily took charge in this room.

Tessie was happy for her sister. She had found a profession that not only paid well but also matched her preoccupations and talents to a tee. If any woman enjoyed leading men around by their privates, it was Emily Ann Crocker. She was in her glory.

Tessie had wangled this weekend visit with mixed emotions. She truly wanted to see Emily after so many months apart. She was dying to see this, the most famous luxury resort on the Skyline Drive. But she also had an ulterior motive. She was waiting for the right moment to make her plea. If Emily weren't so obviously well off, Tessie could never bring herself to ask for such a loan. There was no way that Tessie could make her first year's expenses unless she got help, and she so desperately wanted to attend a good college.

So far, there had been no opportunity. Tessie had just enough time to drop her bag in her spartan room in the workers' block. (She understood that Emily worked nights and could hardly host a sleepover.) Even that little room was a luxury to her, with its smell of clean sheets and almost complete absence of roaches. Tessie even enjoyed the sense of being an insider as they laced their way through laundry rooms and kitchens.

They dined together in the Great Hall, sparkling with crystal and snowy table cloths, amid the refined mur-

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murings of the power elite taking time off from the dreary Washington grind. The women were all gorgeous, it seemed. Emily had to explain that most of them worked for the hotel in various capacities. She tried to describe the complex hierarchy of "entertainers," the fancy local term for house women, but Tessie couldn't keep it straight. The one point she grasped firmly was that Emily was the cream of the crop, at the top of the pecking order.

That point was driven home a dozen times during their lavish meal. A bucket of champagne would arrive, accompanied by a discreet note tendered on a silver salver. Or perhaps a single rose would accompany the note. Or a sampler of rich chocolates. Occasionally, the note would stand on its own merits.

Emily would read each note quickly, then tuck it away for later processing. Sometimes she would look around until she caught the eye of the sender. Other times she would simply smile mysteriously and nod to nobody in particular. Her dance card looked to be filling up fast that evening.

Now they lay side by side on the lambskin rug, laughing like old times about the foolishness of boys, just happy to be together again. Occasionally the phone would flash an imperious summons, but Emily ignored it. Like Tessie, she wanted to stretch out this moment of simple joy as long as possible.

Eventually, the conversation shifted to college boys, and then to college. Tessie hesitated, then plunged in. She explained to her sister how much she had budgeted for her first year, how much she had managed to earn. Expressed dismay at the gap remaining.

"Why, Tessie, honey. Why don't you just go ahead and go? Things have a way of working out." That had always been Emily's philosophy. Somehow, for her, it seemed to work more often than not.

"I wish it was that simple, Em. They don't have that many good jobs in a college town, and I can only work so many hours and still have time to study." Pause. "I was kinda hoping you'd lend me the money." She held her breath.

Emily's expression was unreadable. She started to say something, but the phone buzzed angrily. Someone was using an override. First annoyance, then confusion crossed her face. She got up to answer the phone. An authoritative face bloomed on the screen, scowling deeply.

"Kanemura-san." Emily was practically groveling.

"Why do you block your phone for so long?" Growling. "Do you not know that customers are waiting? Important customers?"

She spoke to the carpet. "My deepest apologies, sir. But I still must speak with my sister. May I please have half an hour more?" Tessie cringed. Why did Emily have to bring her into it?

Kanemura looked past Emily to where Tessie lay waiting, trying to look very small. He seemed to be considering her as much as the question. "Very well. Half an hour. No

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more." The screen went dark.

Emily wiped at her cheek surreptitiously. When she finally looked up again, she wore that brave Southern hostess smile. Like Mama when she burned the chicken and company was over.

"Well, now where were we?"

Instinct told Tessie that now was not the time to support Emily's facade. "College loan," she said flatly.

"Yes, well. Tessie, you know I'd give you the shirt off my back. It's just that . . . well, right now I'm a little short of cash."

Tessie looked around the room significantly. Said nothing.

"Oh, Tessie. Please don't think I'm being selfish. It costs a lot more than you think to live like this. And I gotta keep up appearances or I don't get the customers." Emily's whole body was pleading to be believed. She clenched her fists, bit her lip, fought back tears.

Finally, she whirled and advanced on an antique dressing table. Yanking open a bottom drawer, she scooped up a tumult of papers. Some were crinkled, some torn, all well beyond disarray.

"Here! See for yourself." She dumped the load onto the thick carpet, threw herself into the gigantic, bed, and gave herself over to sobbing.

The icy calm was upon Tessie. She knew that she had stumbled into yet another of life's little horrors. Had no option but to wade through it to the other side. Meticulously, she picked up all the papers strewn on the floor. Dug through the drawer to get the rest. Proceeded to sort them into piles on the delicate little dressing table. Bank statements here, miscellaneous bills there, resort accounts to one side. In five minutes, Tessie brought order to nearly a year's worth of Emily's chaotic financial life.

It was not a pretty picture. She was paid well for her services, to be sure. But the resort exacted a sizable commission on each transaction, withheld even more for taxes. And then there were the resort charges. Emily paid top dollar for her room and all her meals. No staff discounts to be found anywhere. Even the room Tessie was staying in was billed in advance at guestroom rates.

The bills for clothing and furniture were certainly high as well. Emily obviously didn't know a bad bargain when she saw one, and she had a lot of poverty to make up for. At least here she had something to show for some of that money.

It was the medical fees that stopped Tessie cold. The men who purchased Emily's services were not ones to use condoms. Nor were they ones to expose themselves to the current zoo of sexually transmitted diseases, fatal or otherwise. They demanded, instead, that their women be dosed to the gills with Immustim. And they wanted incontrovertible assurance of the fact. The resort managers were happy to oblige, provided Emily and her coworkers paid all the fees—for drugs, doctors' visits, and notarized statements.

Tessie stopped reading long enough to study her sister, still sobbing on the bed. At those dosage levels, sex wasn't much fun. Immustim

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made orgasms much less intense and often led to morning-after depressions. That's why men preferred having their women doctored, rather than protecting themselves. She wondered just how much of what Emily had said earlier was really true.

The medical bills did not stop there. Tessie saw entry after entry for late-night depressants, for mid-morning stimulants. All that stuff had to be hard on the liver. Yes, there were the tests for liver function, and the vitamin shots. All at outrageous resort prices.

Emily was indeed broke. Worse that that, she was in debt up to her eyebrows. And she was losing ground almost daily. A more disciplined person could have avoided the morass, even turned a modest profit. But at its best, her position was not the road to instant riches that everyone pretended it to be.

Tessie took one more quick pass through the papers. There was no place where Emily was outright deceived or locked into her current predicament. Rather, it was a series of high-handed business arrangements, coupled with a wealth of temptations irresistible to a naive young woman, that formed the bars of her cage. For all their pretty crystal chandeliers and linen tablecloths, the resort owners were modern-day white slavers. And her high-class call girl of a sister was just a junkie and a whore.

Tessie finally turned to her sister. Resignedly, "OK, Em, I get the picture." Emily's sobbing had run down. She sat up in bed and looked back at Tessie, her face the disorderly mess of an anguished child.

"I can see how you got yourself into this swamp. Lord knows, any girl would be tempted to cut loose a bit after growing up the way we did." Tessie looked stern. "But it's high time you started getting yourself out of it. If you can't help me, you'd better at least start taking care of yourself."

She gestured at the purse Emily had been carrying at dinner. "You can start right out with tonight. Let's sort out your offers and see how you can make best use of the evening." Tessie figured that a weekend of practical planning would at least start her sister down a more sensible path. She would deal with her own financial problems some other time.

Whatever Tessie's intentions, she seemed to have the opposite effect. Emily's face was again dissolving into despair. She bit off a sob, crawled out of bed, scooped up the purse.

"Oh Tessie. That's what I been trying to talk to you about." She dug out the wad of notes, peeled two off the top. "I been trying to tell you. Just these two are for me."

She threw the rest at Tessie's feet. "Don't you see, girl? It's *you* they want, Tessie Lu. You. Not me." With that, she dissolved again into racking sobs.

The icy calm penetrated deeper. Tessie gathered up her second batch of papers from the floor. She wanted their collective message even less than the earlier message of Emily's financial disarray. Slowly, she read through the notes, making herself understand each one. Most were willing

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to pay her a premium over even Emily's lofty fees. She forced herself to do the arithmetic.

In one night she could earn everything she needed for her first year at college. *No, don't forget the vultures.* OK, take away the commissions, and the rental for a fancier room, and of course the doctor's fees. They would try to take advantage of her, but she could bargain with the best of them. Even after unavoidable expenses and taxes, Tessie could still earn all the money she came here to borrow from her sister. In a whole weekend, she could earn enough that she wouldn't have to work during the school year.

So much money! Freshness must be highly prized at a place like this. Tessie looked hard at her sister. Yes, she could see the signs now. A touch of jaundice in the eyes. Skin not quite so porcelain as before. Worst of all, she recalled a growing callousness of gesture, a smile that was too ready and knowing. Emily was already over the hill.

Tessie knew she could do the job. No matter that she was a virgin, she knew the mechanics of sex in detail. More important, she knew the ways of the male ego and the male anatomy, well enough to hold up her end of a man's fantasies at least. A weekend of Immustim wouldn't be that hard on her system. All it would cost her was some sisterly love. And a piece of her soul.

The phone buzzed peremptorily again. Kanemura-san, no doubt. Tessie looked into her sister's tear-swollen eyes. Tried to look into her own frozen heart. Knew she still hadn't decided, and that she must somehow decide right now. She brushed her hair back from her face. *Oh God, please help me.*

Tessie ended the memory there. Something was pulling her back to reality. She pawed around. Yes, there was Arnie, more cowed than ever. She had indeed found a weapon to counter his raw waves of emotion. He would think twice now about using his special talent to attack her. He feared the icy spears of anger stockpiled in the caverns of her mind.

Then she caught a whiff of wood smoke. Not the heady smell of a fireplace when it tinges the crystal air of a snow-laden evening. No, this was a mixture of old timbers, insulation, and wallboard. It was a fire in the wrong place, feeding on the wrong things. It stank of destruction. Arnie had set the place on fire.

How long the Mansion House had been burning she could not judge. She had been in and out of memory with Arnie twice now. Her sense of real time was gone. From the smell and the crackling sounds around her, the fire had gained a firm purchase. Unless a well-equipped fire department intervened within minutes, the old house was doomed.

And so, very likely, was she. She sat in the darkened kitchen of a house she barely knew. Her body was stiff, kept going only by a drug that was now starting to fade. She knew not which way lay safety and which way danger. And she was under attack by a desperate man with a wild talent,

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pitting his survival against hers. *Oh God, please help me.*

Then the practical side of Tessie took over, as always. If her God was going to help her, she would be the instrument of His deeds. If His will be otherwise, she would be answering for her sins soon enough. Just as she had faced her Mama the morning after Justice left. Just as she had walked away from an angry Kanemura and a sister wallowing in self-pity. Just as she had answered dozens of want ads that first year at college. Until she found the strange but kindly group willing to pay her good money to learn new ways to discipline body and mind.

Tessie Luellen Crocker was not always a winner, but she was never a quitter.

She worked her way slowly out of the lotus position. God was she stiff. The pain was growing in her right arm again, it would soon be useless. She made herself stand up, waited for the light-headedness to pass. The air was definitely worse at this altitude, but still breathable. *Which way to go?*

Her memory of the kitchen told her where to find the light switch. *Big deal, it doesn't work.* Either the fire had killed the power already or Arnie had planned ahead. She knew the pantry and the door she had come through earlier. That left two doors unaccounted for. But where did they lead?

The air was getting thicker, hotter. A small flower of panic blossomed in a corner of her mind, began to grow. *Got to get the hell out of here.* Should she try one of the unknown doors? No, too risky. Better to go back the way she came. At least she knew her way. She walked over to the swinging door, put her hand against the push plate. Froze.

What's the matter with you? Move! You're going to die. She tried to push her way through, but the muscles wouldn't work. *Must be Arnie.* He wants me to stay here until I burn. Get moving! Still she stood frozen.

A distant memory of pain played at the fringes of her awareness. Almost went away. But then came the pungent odor of burning flesh, too strong to ignore. Pain and smell came together. Her hand was pressed firmly against a door that was scorching hot. She yanked it away, suddenly aware of the burns she had suffered.

Nice try, Arnie.

She made it to the sink, plunged her wounded hand under a stream of icy water. That would minimize the burn damage. She needed at least one functional hand and arm if she was going to survive this night. Then, on impulse, she stuck her head under the stream, wet herself down as much as time allowed. *Fire insurance.*

On further impulse, she lashed out mentally. Caught Arnie unaware, still grumbling over his failure to lure her to her death. She ransacked his mind, found the images she needed. Rallying, he recoiled in anger and disgust. Shoved her out. *Sorry, you're too late,* was her parting shot.

Tessie went straight to the proper door, opened it. Reached above and to the left for the flashlight in its bracket. Removed it and turned it on. Winced at the pain. Transferred the

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flashlight to her other hand. Weak as her right arm was, that hand was good for something after all.

She could see the steps leading down into the basement gloom. If Arnie hadn't yielded up the secret, she never would have guessed that this was her only route to safety. She started down.

Arnie was making mental fog again. She knew where he had been a minute ago, knew where he was headed. But she couldn't track him now. She would have to depend on her keyed up senses to protect herself from physical attack. From overhead, she could hear a growing roar. The house must be fully involved in flames. It would not be long before flaming debris came crashing into this separate basement, from whence Arnie had planned his escape.

She came to the door at the foot of the stairs. It was not locked, but it would not open. Something was wedging it shut. She put her good shoulder into it and shoved. It gave a little. Harder, a little more. She shoved harder still and the door opened enough for her to squeeze through. She listened intently. Arnie was nowhere nearby. She squeezed through.

And stepped on something rotten. Immediately, the stench of corruption engulfed her. Tessie gagged and clambered past the obstruction. Her flashlight revealed a tangled horror. Two rotting corpses, barely recognizable as females. One still wore remnants of fishnet stockings. *The missing house women. Poor souls.*

Piled atop the two was a different sort of horror. The body of a man, spine badly deformed, dressed in cast-off clothing. And somehow odd, for all that. Tessie overcame her revulsion, leaned forward to touch the dead man's hand. *Still thawing.* Yes, a substitute Arnie, taken off the streets, no doubt. Stockpiled in some basement freezer against the day when he would be found in the burnt wreckage of the Mansion House. *Looks like Arnie has been planning his departure for some time.*

A breeze started up, there in the basement. A cold breeze that blew shut the door to the basement stairs. A breeze that roiled the stench of decaying flesh and made Tessie gag once again. She stepped away from the carnal heap, swung her light around the basement gloom. Arnie must be making his escape. Overhead something large and structural gave way with a shudder that shook the very basement floor. No time to lose.

She worked her way through the maze of Edwardian relics that cluttered this part of the basement. Heating pipes, a disused coal bin, a more recently installed gas furnace. The history of nearly a century of central heating technology sprawled around her. An HVAC specialist could have a ball down there. *If the ceiling weren't about to collapse in flames, that is.*

In the far corner, mostly hidden by storage bins, she found what she was looking for. The image she had wrested from Arnie's unguarded mind. Remnant of the oldest heating technology the Mansion House ever enjoyed. Steam pipes. And behind that seemingly disused hatch lay the

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entrance to the tunnel that carried the steam pipes up from the street.

The sale of centrally generated steam had long since ended in this town, but the old tunnels remained under the streets. That was how Arnie regularly eluded the guards at Santee Castings, to wreak his depredations on the neighborhood. It was how he eluded even the able Pinkertons to attack Randall and Tessie the night before. It was how he was now making his escape into an unsuspecting world. *Unless I can stop him.*

The hatch was jammed. No surprise. Arnie knew she was hot on his trail. He could only hope to delay her enough for the fire to do its business. But then, he couldn't have put that much time into jamming the hatch. Unless he was waiting on the other side. She pressed her ear against the metal hatch. Listened intently. No, Arnie was going down steps as fast as his uneven legs would carry him.

Tessie planted her right foot firmly against the basement wall. Grasped the hatch handle with her left hand and heaved with all her might. The burns protested, but something gave a little. She put down the flashlight, tried again with both hands. Pain skittered along her wounded arm. But the hatch gave way. She picked up the flashlight and inspected her workmanship. There, caught in an interior lip of the metal hatch, lay the broken broomstick of her dreams.

Her bandage had developed a few red spots as a result of that exercise. She was definitely more light-headed than she wanted to admit. On the other hand, she was still alive and within centimeters of safety. All that was to the good, considering the gigantic crash from above and the shower of sparks through the basement ceiling that followed it. Her damp hair and clothing sizzled. Tessie dove through the opening and hastily pulled the hatch shut behind. She beat out a stray spark or two, then started down. She didn't start to feel even relatively relaxed until she had descended the first fifty steps.

The tunnel was small, just high enough for a man to pass through in a crouch. Just roomy enough to inspect and replace seals on the steam pipes that bracketed the stairs. It angled down at a varying pitch, doubtless running for hundreds of meters before connecting up with the main feeders under the street.

She could hear Arnie ahead of her but couldn't catch him with her flashlight. The tunnel rose and dipped too much for that. It was madness to pursue a killer into unknown territory like this. But then, she didn't have much of a choice. She could not turn back to the burning house, and she could not let him escape. Not while she could still stand and fight.

Wrong time to think that thought. Her legs buckled under her and she fell clumsily. Bent over as she was, she didn't have far to go. But her burned hand scraped agonizingly across the rough surface of the steps. Blisters popped. She waited for the waves of pain to subside, checked herself out. She knew better than to get up right away. She was starting to fade.

She lay back, propping her head

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against the next step up, trying to get as comfortable as possible. Wedged the flashlight where it would best illuminate Arnie if he approached. Her breathing slowed, steadied. It was nice to just lie there and enjoy the cool, silent dankness of the tunnel. *Silent?* Arnie had stopped running too.

For the first time since leaving the kitchen, Tessie probed for Arnie's mental presence. Surprisingly, she found him waiting for her. He was not too far ahead, well within range for his talent. And his guard was almost completely down.

Leave me alone. His thoughts were still not quite words, but Tessie was getting better at verbalizing them. She already knew that Arnie was skilled at reading the thoughts behind her words.

I can't. You know that.

His answer was simply resigned acceptance. Then, *You're very tired.*

Yes. No point in denying the obvious to a telempath.

I can come back and kill you.

You can try.

I can run away forever. Childish overtones.

You can try.

Sooner or later, you'll get tired of looking for me.

Don't bet on it. She knew he could read the iron resolution behind that bald thought.

I can hide real good. Overtones of pride.

I can look real good. Still implacable.

Then, another surprising acquiescence. *Yes, you can.*

Stalemate. Arnie was afraid to come closer, afraid to leave her alive. She could barely move, certainly not with any degree of stealth. But time was working against her. Before much longer, her excesses of the past day would catch up with her completely. Then Arnie could rid himself of his nemesis with hardly any trouble.

But maybe not. The fire department must have been called. It could be fighting the blaze up above even now. They would discover the bodies, perhaps not burned beyond recognition. They would find the entrance to the steam tunnel. Any time now, reinforcements could be on the way.

Give it up, Tessie. She forced herself to look at the harsh realities. They might not even call the fire department, under the circumstances. Even if they did, it would be morning before the ruins cooled enough to explore. The bodies could be misidentified, slowing the search. The hatch could be melted shut. In the best of all worlds, people would come looking for them and become more pawns for Arnie to play with.

Then a worse horror occurred to her. The fire department might already be pumping tons of water onto the blaze. All that water would run into the basement, build up a head of pressure on the hatch. Any minute now, a cascade of water could come down the tunnel and sweep her to her death. Tessie felt the depths of despair.

Despair, is it? Even in her exhaustion, Tessie caught the oddity of that last thought. In a flood, Arnie would

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die along with her. That would not be a reason for her to despair. Regret, perhaps, but not despair. Arnie was at it again.

She rallied enough to raise a weak block against the raw emotions that roiled over her. Pawed through her memories for a counter. It would have to be a really nasty one this time. She found the pick of the litter, one well hidden for years.

You want despair? Try this on for size. Then doggedly, desperately, she dragged Arnie kicking and screaming into her private little nightmare.

Tessie sat on the edge of her hospital bed, barely covered by the worthless little hospital gown. Doc Coolidge was trying to tell her something, but she was having trouble hearing him. He was nattering on about fallopian scars and ectopic pregnancies, epitaphs to future babies she would never bear. But she was still fixated on the glorified blood clot she had captured in a Dixie cup earlier that morning. It seemed so perfect in its delicate detail, so full of life and promise. Yet it was dead. She still did not know how to write its epitaph.

The burning in her gut was subsiding, thanks to the banquet of pills Doc had offered up to her earlier. She could see the bottles, lined up like brave little soldiers on her night table. A pusher's fortune, a junkie's vision of heaven. Doc trusted her to do the right thing with them.

She had half-raised his kids after Nellie died. Changed diapers, wiped tears, helped them with their homework. It was the easiest money Tessie had ever earned as a young girl —mothering came so natural to her. The oldest was just starting high school and he still called her Aunt Tessie.

Of course, she had enough sense to finish college first, before she started her own family. At least until Akihiro came into her life. Akihiro, My Hero, she called him. They met in October, became an inseparable item on campus almost immediately, moved in together just after Christmas break. The roller coaster ride began in March, when she found out she was pregnant.

First came the despair. Their budget would be shot by the cost of the abortion. She stumbled blindly through three classes before she realized that she was incapable of such an act. A brief elation that she was destined to be a mother. Then despair at the damage to their plans for the future; determination took over and her spirits soared. Only to falter at the fear of Akihiro's reaction.

He seemed to take the news well enough. Perhaps he was a bit less enthusiastic than Tessie had hoped, perhaps he turned a bit quieter. But they talked through how their future would change. Worked out how Tessie could still graduate on time. Went to her prenatal checkups together. For nearly two months, Tessie was blissfully happy.

When the pains started, Tessie tried to stay calm. She went to the clinic just to play safe, she said. The nurse practitioner called her back in personally to read off the list of vile diseases she was carrying. Asked her

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for a list of all her recent sex partners. *All my recent sex partners.*

Akihiro was stone-faced. Yes, he had been with other women, No, he didn't know all their names. Some had been streetwalkers. *Streetwalkers.* Too bad about the infection, but Tessie had to realize he was destined to return to Milwaukee and join the family business. His parents were traditionalists. They would never accept a *gaijin* daughter-in-law. In her own country, she was a foreigner in this man's eyes. And she thought she knew him.

A week before exams, half crazy with pain, Tessie moved out. She had no place to go except back to Virginia. At least she had friends there, and family. Someone might take care of her.

Now here was Doc Coolidge telling her to avoid getting pregnant in the future, if she valued her life. *If I value my life.* He ran down and stopped, knowing he had lost his audience. Studied the young woman he loved like one of his own daughters. Shook his head sadly.

He cupped her cheek gently, kissed her on the forehead. "I'll see you in the morning, Tessie Lu. You sleep well, now, y'hear?" And he left her alone to mourn her unborn child.

Sleep. *God, if only I could.* She studied the row of medicine bottles. Understanding dawned. Doc knew her well, probably better than her own Mama. He was the father she never had, the only man she could talk straight with. He knew the depth of Tessie's loss, offered her the only real solace he could. If Tessie did not wake up tomorrow, the death certificate would say nothing about suicide.

She brushed the hair back from her face. The medicine bottles waited patiently. Doc trusted her to do the right thing with them.

A raw scream tore the memory to shreds. Tessie swam up from the depths just in time to see Arnie throw himself on her. She blocked him with her good forearm, deflecting his weight before it knocked the wind out of her. He clawed for her throat. She levered him over onto the steam pipe to her left. His head thumped resoundingly on the pipe. Unfortunately, asbestos insulation dissipated most of the blow. He shook his head and waded into her again.

The adrenaline surge wasn't helping much. She had already used up her wishes several times over with the man-made version of the same chemistry. And Arnie was strong. He fought with untutored desperation. *So let's see what tutoring gets me.*

She tried a snake strike to the eyes. His hand met hers halfway, deflecting the blow easily. A knife hand to the throat. Same thing. A knee to the groin. He grabbed her knee easily, pushed it aside. Smiled as he kneed her viciously instead. The pain was almost her undoing. Now she could expect internal bleeding to further sap her strength.

God, how do you battle a mind reader? The answer came quickly. *Easy. Don't give him a mind to read.* With pure malice aforethought, Tessie went berserk.

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She pummeled, scratched, kicked, and bit. Arnie did the same, but not nearly as well. He had strength and desperation fueling his attack. She had years of combat training, honed by mortal determination, focusing hers. Arnie shifted to the defensive, covered his head with his hands. Tessie grew bolder, fought ever harder.

Then she was on top, Arnie face down and helpless, unable to land blows. Tessie planted a knee in the middle of his back, cupped his chin in her left hand, ignoring the cacophony of pain from various parts of her anatomy. She pulled back hard, bending his head back at a dangerous angle.

But the neck would not give. The thickening of bone that had made him look the freak all his life now served Arnie well. Tessie's strength was just not up to the task. She brought her right arm to bear, as she had earlier with the hatch. This time, however, success eluded her. Even tuning out the pain as best she could, she could not summon the necessary additional strength.

Then Arnie spoke for the first time in her presence. His voice was half strangled, but still bore many of the rich tones of his half-brother. "Bitch. Slut. Whore. Jap lover."

Rage took over where the mere drive for survival had failed. Tessie heaved again. Bones cracked. Arnie went limp. "Thanks," she said, "I needed that." With incongruous gentleness, she lowered his head carefully to the rough stone.

Arnie was still alive, but the fight had gone out of him, mentally as well as physically. Tessie felt layer after layer of anger melt away within him. His mind grew calm, more innocent, almost that of a child. From deep within bubbled up a pre-verbal thought, its meaning crystal clear. *Thanks, I needed that.*

Tessie lay down beside him, fighting to stay conscious. Now her biggest problem was keeping the two of them alive until help came. She didn't want to think what would happen if that help never arrived. She stroked Arnie's hair, crooned soothingly to him.

Mama, is that you?

Yes, son. Mama's here.

I've been scared, Mama. Please don't leave me again.

Don't worry, son. I'll stay with you.

They drifted along together.

Then, *Tessie?* It was her (name, ego, identity symbol), no question about it.

Yes, Arnie?

Want to show you something.

OK, show me.

It was that magical little place in the mind of every child, locked up and kept safe from the everyday horrors of real life. Arnie had decorated his with the usual assortment of happy memories and innocent dreams. Only the memories were mostly old, from when he and Randy played as children. And the dreams were largely unfulfilled.

Tessie understood. She spoke aloud the formal words, knowing he would capture the heavy freight of emotion that came with them.

"Yes, Arnie. This I will do as if I were you."

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Arnie relaxed, drifted off again, leaving Tessie with a wondrous discovery. For the first time in too many years, the woman and the little girl within had spoken with one voice.

And then Arnie began to die, his mind breaking up a piece at a time. Tessie knew she could do nothing to save him. She was barely hanging on herself. As she had done in other ways, with so many others, she prepared to ease his passing.

But that was not going to be as easy as she hoped. From deep within him, she saw the explosion start to build. His wild talent was hooked in down there, controlled by the ancient animal brain. When it blew, it would radiate raw emotional power like nothing Arnie had ever willingly essayed. It was going to be bad.

Tessie recalled her uncle J.G., who went off to war and never came home. In his place, they shipped back a sealed coffin, a medal, and the story of his last brave act. A guerrilla had lobbed a hand grenade through a window of the mess hall. J.G. threw himself on the grenade, trading his own life that dozens of his buddies might live. For years, Tessie struggled to comprehend how J.G., young as he was, could bring himself to make that instant sacrifice.

Now she knew. There was no place for her to run or hide. Better she do what she can to protect others than to waste her last moments in futile evasion.

She wrapped her exhausted and bleeding body around that of her last victim. Not that it would help contain the mental blast. It just felt like the thing to do. Then, cradling Arnie to her breast like the child she never had—would never have—she absorbed the full force of the psychic explosion.

Someone had stocked the pool. Little fishes swam around in the stillness of the deep. Occasionally, one would bump into Tessie, release a tiny bubble of thought.

Bloop. *Wish somebody would oil this damn cart. The wheels squeak loud enough to wake the dead.*

Blip. *Her naked body appeals to me. Do I dishonor her by finding her so attractive?*

Borble. *They say she's a killer, but she looks like just another downtrodden woman to me.*

Brit, brit. *A typical gaijin doctor, I think, but I must be ever vigilant.*

A bigger fish swam up, bumped hard. *Nice boobs. Wish I were twenty years younger.*

Tessie kicked for the surface. It was a long way up this time. *Can I make it?*

"Doctor, looks like she's coming around."

"Yes, I think you're right. Let's see if she knows which way is up."

Tessie opened her eyes. A stereotypically white-haired male doctor was watching her closely. At the foot of the bed stood a nurse, a thirty-ish woman, smiling encouragingly. Flanking the head of the bed on either side were two Pinkertons. Bouquets of various sizes decorated most horizontal surfaces. Bright sunlight shone through a window. Mentally, she began assigning thought fish to people.

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"Do you know who you are?" He was the one admiring her breasts just a bit ago. *Good profession for a tit man.* But how to answer his question? *I am every man and every woman.* No, that's a good way to earn a padded cell for the rest of whatever.

"My name is Tessie Crocker, Dr. Auerbach. How long have I been here?" He started when she called him by name, then grinned shamefacedly. His hospital pass tied his name and face together for all to see. He covered by examining her pupils carefully, doing the other things doctors do to stay in control.

"Mmm." Noncommittally. "You were admitted last Monday evening, shortly after midnight. It's now Thursday morning, almost noon." *Two and a half days!*

He gave her a once-over. "Looks like you might recover, thanks more to the elasticity of youth than to our efforts. Though Lord knows you did your best to burn out a perfectly healthy young body." A tsk-tsk shake of the head, reserved to those who are permitted to pontificate. He opened his mouth to do just that, then caught himself. Looked from guard to guard.

"Any chance you can get your friends to leave? None of the rest of us have had much luck. I've got a few health matters to discuss with you that you might prefer to cover in private."

She looked at the guards herself. "I seriously doubt it. They won't quit until Shimizu-san thinks I'm safe. And until I talk to him at some length, I don't think he'll change his mind on that topic." She smiled encouragingly. "But go ahead and talk. I don't mind if they listen in."

"Hmph. Very well." He referred to his notebook screen. "I'll skip the minor contusions. Second-degree burns on the left hand. Should heal with no scars." Tessie flexed her bandaged hand.

"Bullet wound on the upper right arm. Field patched. Patch ripped in five places. That took some work." A measured look at the arm, once again firmly strapped down. Only her hand was the least bit free, and that hosted an intravenous feeding tube. Another tube snaked discreetly under the blanket, probably leading to a catheter.

"My bet is you'll find the arm a little stiff from time to time, but we think we've minimized the scarring." The doctor seemed to assume that appearance was more important than function in a woman's body.

He punched a button to flip the page. "Minor abdominal injuries that should also heal nicely. We did have to deal with a bleeder or two, but we avoided any heavy cutting." He looked at her sternly. "While we were tidying up, I took the liberty of cleaning up that scar tissue in your uterus. You really should have attended to it years ago, you know."

It took several seconds for his words to register with Tessie. "You say you cleaned it up? Just like that?"

"Of course. A fairly standard procedure these days. I should warn you, in case you've grown careless lately—it's going to be a lot easier for you to get pregnant from now on. If

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you don't watch out, you'll be a mother before you know it." Another tsk-tsk shake. "You young people always think you have years before you'll want to start a family. You're better off keeping on top of your reproductive health, you know."

Tessie's world was reeling. *Start a family!* She needed time to think, to absorb such a concept. Doc Coolidge was a good man, but he obviously didn't know everything.

"Is that the list, Doctor?" He nodded. She smiled warmly. "Then I thank you for your care. Looks like I've been placed in good hands." She closed her eyes briefly, trying not to be too theatrical. "And now, if you don't mind, I'd like to rest some more."

"Of course." He nodded toward the nurse. "Nurse MacIntyre will help you remove some of that plumbing, once you've proved you can function without it." He gestured toward the nurse, turned to leave. She smiled at Tessie once again, followed him out the door. Tessie was alone with her two guardians and a mind whirling with thoughts.

Start a family! She knew Dr. Auerbach was right. He had been extremely conscientious in checking her out, stitching her back together. The Santees were long-standing benefactors of City Hospital, and Randy played golf regularly with Jim Auerbach. Now, there was a dirty old man who had sublimated almost perfectly his passion for fondling women's bodies.

Even Eleanor MacIntyre had to admit that Auerbach knew his stuff. Much as she disliked his paternalistic attitude, she . . . Tessie froze in midthought. *How do I know all these details? I've never met these people before in my life.*

Then the thunderclap. *Sweet Jesus! I can read minds!*

She thought back. She took it for granted that all her interactions with Arnie leveraged off his talent. Or did they? That critical incident in the kitchen, when she ransacked his mind. Who was the active agent then? She wasn't sure. It had become so natural to exchange thoughts with Arnie, she hardly noticed when she started listening in on others. *The thought fish, of course.*

Perhaps it was Arnie's exploding id that changed her. Even now she could feel pieces of Arnie stuck, like shrapnel, in various parts of her persona. She was still Tessie Crocker, no question about that. The trauma may have awakened something lying dormant in her, but it hadn't made her into an ersatz Arnie

So you're another one. That was Arnie's first reaction when he got a close look at her mind. He recognized her for a kindred talent, even if she hadn't yet awakened to the fact. Maybe that was why she was so quick to counter his attacks. That was why Arnie knew she could track him down.

Tessie recalled a dozen incidents from her childhood. She always seemed to know when a child was unhappy, what made a baby cry. Some people would have found her insights uncanny. The older women simply said she had the gift of moth-

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ering. Tessie was just a telempath in waiting.

No, that wasn't the proper term. Arnie had sold that bill of goods to his keepers, probably to minimize their anxieties. He could receive as well as send, and much more than emotions. He was indeed a telepath. And so was she.

Then she should be able to influence others just like Arnie. The urge to experiment was suddenly overwhelming. The two Pinkertons were handy. *No. Not my brothers in arms.* She craned her head around. There was the call button, laid out within easy reach of her free hand. She managed to trap it despite the bandages, pushed the button.

Within seconds, Nurse MacIntyre was back in the room. She saw that Tessie was not in distress, smiled her patented smile. "Yes? Is there something you need?"

"I guess I'm not as tired as I thought. I'd really like to try a trip to the bathroom."

"Certainly. Let's get you unhooked." She began the delicate business of unstrapping tubes and removing needles. Tessie felt her guards tune out—they would grant her privacy inside their heads if nowhere else. But it was Nurse MacIntyre who commanded her attention.

Tessie probed gently. She didn't want to startle the woman, certainly not while she was working with anything sharp. That proved to be less of a problem than she feared. If Tessie was a telepath, she had a lot to learn. Thoughts came to her in blasts, then none at all for long stretches. Tessie pushed harder, was rewarded just once with a fleeting frown from the other woman. She pushed even harder, or so she thought. Nothing. *Oh well, nothing good ever comes easy.*

Nurse MacIntyre had helped her out of bed and into the bathroom. Tessie broke off her mental experimentation to check out her own body. She was weak and uncertain, but that was to be expected. Dr. Auerbach was right about her youthful elasticity. She was mending fast.

Her bladder was empty and her gut was not ready to work. So Tessie contented herself with knowing she could make the round trip, even if she did have to lean heavily on her companion this first time. She returned to bed mildly giddy from the effort. And even giddier at the prospect of one day controlling a talent in the same league as Arnie's.

I'd bloody well better show more self-control than he did. That would be the challenge. She was fortunate that she had learned discipline first, before being afflicted with such a dangerous gift. She must never fall into the easy habit of controlling people to achieve her own selfish ends. That was a clear road to hell.

A warning knock sounded at the door. It opened a broad crack and a man's head peered tentatively around the door.

"Heard you were awake. OK if I come in?"

"Randy!"

His boyish smile was undiluted this time. "So it's Randy now, is it? What did I do to deserve the promotion?"

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He pushed through the door, revealing a ridiculously large bouquet of red roses. Advanced on the bed. Nurse MacIntyre broke off her fussing over various arrangements, and relieved Randy of the flowers midway through his crossing. She winked at Tessie and disappeared out the door.

He obviously wanted to scoop her up and embrace her fiercely, but he was equally afraid to damage anything still healing. She wanted and feared much the same. They dithered like two teenagers not quite knowing what territory was off limits. Until they dissolved in giggles. He ended up bent over awkwardly, cheek to cheek with her, while she did the fierce hugging with her good arm.

Tessie was happy for the minor confusion. It covered a deeper one she felt at his words. *When* did *he become Randy to me?* She dug backwards through memory. *Of course, Arnie.* She now carried his treasure trove of childhood memories and dreams. Randy Santee would ever more be a playmate to her, a fellow child from happier days. *This I will do as if I were you.* Tessie felt as if she had just made her first payment against Arnie's wergild.

She released him before his back gave out. He straightened slightly, stroked her cheek. Soberly, "I was afraid I'd lost you."

"Yeah. Me too. I'm afraid you have lost a brother. I'm so sorry."

He shook his head. "I lost Arnie sometime back. Or he lost himself. What you did was a kindness, in the end." Another caress. "Arnie's face was so peaceful when we found the two of you. From the way you were holding him, I could tell you were comforting him in his last moments. Thank you."

"You saw us? In the steam tunnel?"

"Why, yes. You were almost directly under us, near where the original factory buildings tied into the steam lines. We all felt a lot of the last, uh, pyrotechnics. I suddenly remembered how Arnie and I used to explore those old tunnels as kids." Chagrin. "He must have suppressed those memories in me, or I would have guessed his secret avenue long ago."

Suddenly remembered, indeed. She had been so quick to ascribe all sorts of unexplainable results to Arnie before. Usually, she was wrong, she knew now. But this time, she suspected that he was indeed the agent of her rescue. A parting gift from a mortal enemy. *Thanks, Arnie.*

"Anyway," Randy continued, "I insisted on leading the search party. Didn't make Shimizu-san very happy, but he had little choice in the matter." Soberly again, "I wanted to be the first to know, whatever the outcome."

She nodded, considered for a moment. "I have to say that waking up just now was a pleasant surprise. Arnie was every bit as tough as I'd feared."

It was his turn to nod. "You were delirious off and on most of yesterday. I was afraid that the fight had cost you your hold on reality."

So that was why Dr. Auerbach asked her if she knew *who* she was, not *where* she was. She held up her

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burned hand, studied it.

"I long ago learned a simple rule. The real world is the one that kills you when you try to ignore it." She shuddered, decided to change the subject. "You know, Arnie could have escaped." Raised eyebrow, answering nod. "I was beat and he had a clear path to freedom. Instead, he came back to fight with me."

Tessie was lost in memory. "He knew I would eventually come after him again. He also knew how determined I can be. But that's not why he came back." She looked at Randy levelly. "Your brother was wracked with guilt over what he had done to those poor women. He knew he would keep on doing such things. He was ready to die."

Randy said nothing, knowing she was not finished.

"I'm going to let you in on a little trade secret. The easiest part of an assassin's job is what most people think is the hardest. By the time we're called in and all the papers are signed, the victim is almost always ready to die. All we have to do is play out our part in the drama." She did not say *subject*, not with this man, not in this context.

"Have you any idea how hard it is to get a company that mad? Mad enough to spend the kind of money it takes to get someone legally killed? Sorry, of course you do. People don't end up as victims by accident, or on a whim. They have to push long and hard to win that exalted status. The payoff for them is that they get to die and it's not really their fault. They get to be victims. They avoid the usual problems of suicide. No special courage required. No Christian sin. No problems with insurance companies refusing to pay their beneficiaries."

She held up her good arm, as if to ward off a challenge. "I'm not saying we assassins are innocent. Not by any means. But speaking for myself, I've never had to kill anybody in cold blood."

She caught his glance. " 'Struth. A lot do like Arnie did. They attack like gangbusters, knowing they're going up against trained killers, expecting to lose in the end. I'd rather have desperate people like that attacking assassins than unprepared civilians.

"Some just let themselves get cornered. Give them the option to disappear without a trace and they turn you down, believe it or not. Show them several ways to commit suicide painlessly and they jump at the chance. Mostly, people lack imagination and access to good technology."

Another level glance. "You'd be surprised how many people really want to be responsible for their own demise, provided nobody has to know it's suicide." That was a lesson that Tessie had learned while painfully young.

"I'm sure that some assassinations are as cruel and raw as the quasidocs portray them. But I've never been forced to act that way. I pray to God I never am. It's hard enough helping people die when they want to." Tears welled in her eyes and she fell silent. *Too many ghosts.*

Randy squeezed her hand. Gave her the gift of a few minutes of silence.

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Eventually, he spoke. "Seems to me you have grounds for appealing most of those findings. If not all. You should get your money back."

Tessie shook her head impatiently. "No, you don't understand. You can't tell on a suicide. That's part of the bargain you strike with the victim."

"Well, then, what about the other cases? Self-defense has to be a legitimate plea if someone attacks you first."

More impatient than ever. "You've been watching too much television. Sure, every assassin dreams of being able to keep wite and wergild. It's one of the few paths to retirement you can hope for." *Other than death.*

"But we all know why the law works the way it does. Every state is desperate for revenues. If there's bloodwite to be had, they're going to claim it. They'd even tax the wergild if the public would sit still for it. As it is, they get over half the assassin's fee in taxes." She intentionally used the more honest term "bloodwite," instead of the sanitized shorter form favored in law.

Randy smiled mysteriously. "Maybe not always. I've been talking at some length with your Detective Joe Heatherington. He was there for all those pyrotechnics I was telling you about." Another smile. "Seems he flatly refuses to file any charges against you. Says you were acting as his agent in attempting to apprehend a dangerous killer. Claims it was an open and shut case of self-defense."

"That's nice of him. But it won't wash. I'm telling you that the state never quits. Someone higher up will insist on bringing charges. They want that bloodwite."

A mock scowl. "And I'm telling you that this case is different." A tempering grin. "We tracked down the guy who ordered the heat on you. Pretty high up downtown. Seems he was pressured himself, but I won't tell you how. At least not quite yet."

A broad grin. "Pressure comes in many forms. Joe and I managed to convince this guy that you were not acting under Kumagai rules in this matter. The papers on Arnie's death have already been filed. Case closed."

That was the third shock of the day. Had Tessie not just slept for two and a half days, she would have been completely overwhelmed. As it was, she was starting to feel numb. She knew she should be jubilant, but she was fresh out of strong emotions.

So she was a wealthy woman now. *No, don't forget the vultures.* Of course. She'd have to pay over half as taxes. No business expenses like wite and wergild to deduct. So the Feds get the bloodwite, by another ruse, instead of the state. No difference to her. And most of her commission in the bargain. That still left her the wergild, free and clear. *Arnie's wergild.* She was still pretty wealthy.

She'd have more than enough to buy Emily's freedom, and to provide for her Mama. And still there'd be a modest amount left over to keep for herself. *Just as well. Being a telepathic assassin is certainly a mixed blessing.* She shuddered at the thought of how efficient she would be at hunting people down. And how much more empathic she would be with her victims.

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She had always been quite empathic enough, thank you. Probably yet another early manifestation of her hidden talent.

Randy was smiling broadly now. He captured her small hand with both of his. How different that gesture from when he had first clung to her, seemingly for dear life, in that dreary hotel room.

"There's something very special about you, Tessie Crocker. I know you're much more than a simple assassin. At least you can be. You run rings around us in business analysis and planning. You command the respect of Asahi Pinkertons. You even talk about rebuilding the country as if you fully expect to make a real difference. And you know what? I believe you will."

A part of Tessie reveled in his praise, but another part was sounding alarm bells. She had spoken too freely and too often about matters best kept secret. What did he know? What did he suspect? Reluctantly, she reached out to him with her erratic new talent. As she had hoped, Randy's defenses had been worn down by years of probing by his brother. Lacking Arnie's deftness, she probed gently but persistently.

"Look, I know you have your secrets," Randy was saying. "You'll always have a life of your own that you can't share with me. But I'd like you to consider sharing what you can. All I can say is, I've been happier around you than I've been in many a year." A shake of the head. "And that's true despite everything else that's happened since you arrived. Think what it could be like for us if life were basically peaceful." Another grin.

Tessie relaxed a little. He suspected nothing specific. And he was absolutely genuine about his feelings. But she had found what she expected to find, and that made her feel more than a little guilty.

So you're another one, Arnie had projected to her. There was no surprise in that thought, no joy or shock at a unique discovery. He had known others like himself, besides her, and his circle of acquaintances was small. Randy assumed, like the others at Santee Castings, that Arnie's unique talent came solely from his mother. She was the woman of mystery who died in childbirth.

But Tessie had suspected otherwise and now knew for certain. Dimitrios Santee also carried the wild talent. The man of strong passions who had such a way with women. The man who had had an affair even with his wife's sister. (Yes! And that sister had started this disastrous chain of events with a deathbed confession to her son. Giles must be consumed with anger.)

Santee was the father of *three* unusual sons—a charmer of a legitimate child, a gifted conniver born of cuckoldry, and a crippled bastard in whom the talent reached full expression. What a heritage.

It was one thing to keep her own talent secret from Randy, at least for a while. But to keep Randy's own power secret from him for long would be unthinkable. Already, she yearned for the day when she could be completely open with him. Per-

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haps more open than she had ever dreamed.

Randy smiled at her and squeezed her hand again. A flicker of emotion came her way, a mixture of happiness and lust and—could it be?—yes, even love. She knew the depths of this man now, knew that love was no passing thing for him.

She knew, for the first time in her life, that a man could love her as much as she loved him. Yes, she did love him, honestly and truly. She could dare believe that such love could lead to something lasting. Once again she could dream of marriage and even family. *And what a family it might be!*

Tessie was careful to reveal none of these emotions. Now was the time for healing, and for cleaning up messes. There was Giles Edwards to neutralize before he fully awoke to the power he had already learned to misuse. And a talent of her own to train. And other serious matters to discuss with Shimizu and their fellow neo-samurai. She must husband her strength.

She and Randy must learn each other's ways slowly and thoroughly. That's how you build a relationship for the long haul. And, Tessie knew, she must learn a new openness with equal care. She must trade the caution of a killer for the kinder restraint of the telepath.

So Tessie returned Randy's smile and squeeze with just a hint of happy reassurance. Because she was neo-samurai, she knew she must first carry out her duties. But because she was still a country girl, her heart sang. ■

IN TIMES TO COME

July is one of our double issues, with lots of room to do extra things. This particular July is special in at least two other ways. It marks the 25th anniversary of Apollo 11, the first time human beings walked on another world. One of the men who did so, astronaut Buzz Aldrin, makes a special appearance (with Aleta Jackson) in *Analog* next month, with a fact article spelling out a plan by which we might return to the Moon in the near future—to achieve the grander things to which the Apollo missions should have been a mere prelude.

This July will also be the occasion for a notable real event elsewhere in our Solar System, which inspired a linked pair of items in next month's issue: Peter L. Manly's fact article "Multiple Comet Strikes on Jupiter," and the novella "Symphony for Skyfall" which Pete co-wrote with Rick Cook. No, it's not about Earthbound astronomers watching the show; Cook and Manly's protagonists have a far more "personal" interest in what's about to happen. . . .

The lead story for the issue, and the inspiration for George H. Krauter's cover, is the novella "Sam's War," by former *Analog* editor Ben Bova. Ben is justly famed for his highly realistic extrapolations of humanity's near-future moves into space, and in "Sam's War" he's thought of an angle that seems, with hindsight, oddly neglected heretofore. There's a certain part of the Earth's surface which is especially favored for getting into space; what those who build spacecraft too often forget is that other people *live* there—and may someday take a very active interest in the process of getting from here to there!

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BIOLOG Jay Kay Klein

Marianne Dyson earned a BS Cum Laude in physics at the University of North Carolina, followed by a year of full-time graduate studies in space physics at Rice University, Houston. She became the second woman to be a NASA flight activities officer in Mission Control, and helped form the first married couple to work in Mission Control when her husband joined NASA six months later. They were on the team for the first space shuttle flight.

After the fifth shuttle flight she left NASA to raise a family. She still managed to work part-time as a consultant under contracts to ESA and the NASA life sciences area. Marianne is also a space activist, working with National Space Society causes to educate people about space. She attends science fiction conventions to be with others who also love space travel and hard-science SF.

Marianne continues to think full-time about SF stories and write them when she can. Her particular focus is on space travel, which as always is the center of her interest. She hopes to inspire young people to look forward to traveling in space and growing up to work towards that goal. Her first SF story was a script in the fifth grade for a puppet show "Trip to Venus," shortly after she discovered Robert Heinlein's novels for young people.

Appearing in the August, 1990 *Analog* was a special event. Marianne's view of science and SF is that these are emotional experiences deserving exultation through prose and poetry as much as other human activities. Her stories start with a plot idea, but

(Continued on page 168)

Marianne J. Dyson

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Michael F. Flynn

PSON OF PSYCHOHISTORY

Looking Backward at Looking Forward

Attention, class. If you will turn your textbooks to p. 65 of the April, 1988, issue of *Analog, An Introduction to Psychohistory*, I would like to draw your attention to Figure 4a, reproduced below as Figure 1. This graph, representing the *approximate* timing of the four major cycles in the American economy, was drawn by Edward R. Dewey and Edwin F. Dakin [*Cycles*, Henry Holt & Co.] in *1947*. As noted in the article, the chart [henceforth "DD"] clearly showed the Great Recession of the early 1980s when all four cycles went south within a few years of each other. Government revenues, which had been running between 18% to 20% of GNP flattened out for several years because the GNP flattened out. Government *expendi-*

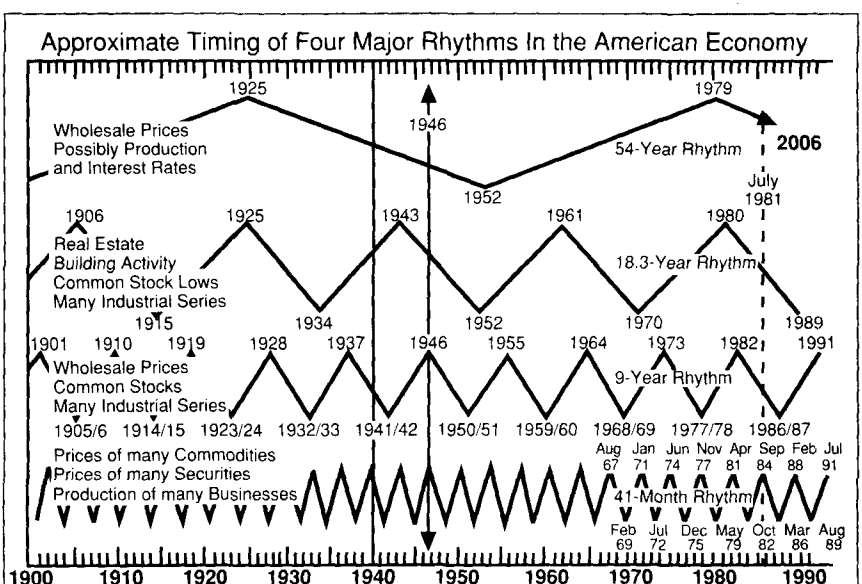

Figure 1: This family of cycles appeared in the 1950 edition of Dewey & Dakin's book on economic cycles. Note the accurate forecasting of "the worst recession of since the 1930s." Reagan gave Carter the credit on that one; but he took credit for the upswing that followed.

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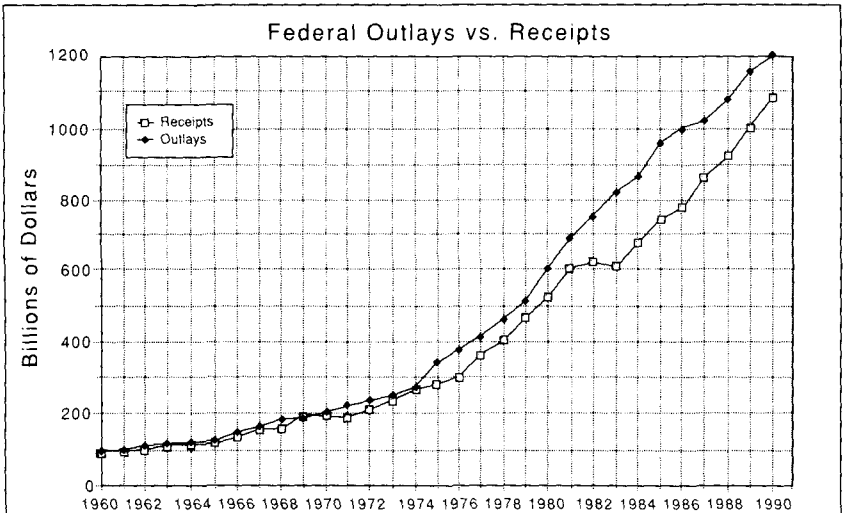

Figure 2: Outlays and receipts of federal government. Does not include "off budget" items. Source: Statistical Abstracts of the United States, Ser. Y339 and 340.

tures continued to increase, so the annual deficit ballooned [See Figure 2.][1]

DD showed recoveries from Oct '82 to Sept '84 and, supported by two cycles, in 1986/87. By late 1989, three cycles were heading up. These "recoveries" were tempered by the continuing, long-term decline of the Kondratieff cycle. All this in a chart published in 1947.

Bringing You Up to Date

The astute student will notice that the nine-year cycle and the 41-month business cycle cashed in their chips in July 1991. At this point, three of the four cycles were down. Thus, DD forecast another sharp recession in the early 1990s. Would you say that was close? American voters checked to see who was in the White House and decided to burn him in a wicker cage to appease the gods.[2]

Thus far, the chart as it appeared in DD's original 1947 book and the April 1988 *Analog* article. It is simple math to project the cycles to the present and beyond.

January 1993: The 41-month cycle turns around and a recovery commences. Sound familiar? Economists now admit that the recovery was actually building up steam before the last election, but it somehow escaped the notice of the media. Maybe Clinton knew this and hoped to get his stimulus package into the headlines

[1]Revisionist attempts to assign the blame to "Reagonomics" violate basic physics: an effect cannot precede its cause. The big tax cuts did not kick in until *after* the gap had opened up; whereupon, government revenues resumed their upward progress. See ole Fig. 2 again.

[2]The tradition of sacral kingship is of long standing in the Celtic and Scandinavian north. When the crops fail, sacrifice the king.

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before the economic good news became recognized? The public, always a sucker for *post hoc ergo procter hoc*, would associate the recovery with the package and salivate like Pavlov's dogs.[3] In fact, maybe this was why he decided to run at a time when the Bush-man looked unbeatable. If he *knew* the economy would sour before the election and then pick up again right after . . .

DD even shows that the current recovery is anemic. The 54-year Kondratieff is still plumbing the depths and will not hit bottom until ≈2006; and the nine-year Juglar cycle is still heading for its 1995/96 bottom.

Bringing You a Blind Date

Since this is *Analog*, what will the future bring, according to DD? Some key dates:

Dec 1994: business cycle sours again. May or may not be apparent in time for the November Congressional elections. Clinton will Bush it up: Recession? What recession?

Mid 1996: three cycles heading down, though two will have hit bottom and possibly started back up. The loyal electorate will probably put Clinton in a wicker cage and burn him, too. President Kemp?

Mid 1998:18-year and 41-month cycles peak and head south again, this time well before the congressional elections.

Mid 2000: Three cycles down. Good-bye, President Kemp. Hello, President X.

Late 2001 until 2006: Things are pretty much at rock bottom. In 2003, all four cycles will be dropping, and we say good bye to widely despised president X. Temptation, a la FDR, to get out of the depression via foreign war? WWII was a trough war, too.

Late 2006 and really picking up by mid 2007: It's rock and roll time. All four cycles heading up, especially the long wave. Whoever was elected in 2004 to "save the economy" will get the credit and will be reelected. Recessions from now until 2035 will, with one exception, be perceived as "slowdowns in the growth." If the next Kondratieff upswing holds pattern with the last few, we will see the exploitation of a new energy source: Steam—electricity—solar power satellites? And the creation of a new infrastructure: railroads—highways/airports—Delta Clippers and orbital factories?

The Crisis of 2017: From mid-2017 until the early 2020's, three of four cycles going down again. Even with the Big Guy holding things up, the scene could be pretty tense.

ca. 2035: Every other Kondratieff wave featured a major American War just before the peak. The Revolution, War of 1812, the Civil War, WWI, and Vietnam. Each was followed by a brief Era of Good Feeling or Roaring Twenties. What sort of war will be fought, if the pattern persists, when there are hundreds of orbital factories and space stations and single-stage-to-orbit vehicles are as common as jetliners today?

A Parting Comment

Remember, you heard it here first. ■

[3]The economy is a high viscosity system. It takes *time* for an input to show results.

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THE REFERENCE LIBRARY Tom Easton

Lake of the Long Sun, Gene Wolfe, TOR, $21.95, 352 pp. (ISBN: 0-312-85494-3).
The Last Dancer, Daniel Keys Moran, Bantam, $5.99, 597 pp. (ISBN: 0-553-56249-5).
Earthsong, Suzette Haden Elgin, DAW, $4.99, 255 pp. (ISBN: 0-88677-592-2).
Orion and the Conqueror, Ben Bova, TOR, $22.95, 351 pp. (ISBN: 0-312-85447-1).
Scissors Cut Paper Wrap Stone, Ian McDonald, Bantam, $3.99, 136 pp. (ISBN: 0-553-56116-2).
Yellow Matter, William Barton, TAL Publications (P. O. Box 1837, Leesburg, VA 22075), $5.95, 37 + vi pp. (ISBN: none) (1000 copies only).
The Search for E. T. Bell, Constance Reid, Mathematical Association of America (1529 Eighteenth Street NW, Washington, DC 20036), $35, 372 + xii pp. (ISBN: 0-88385-508-9).
The Art of Michael Whelan, Michael Whelan, Bantam, $60, 201 pp. (ISBN: 0-553-07447-4).

Many writers seem to believe that good story-telling means establishing a pell-mell rush of turbulent action that, like a white-water river, carries the reader over and past any possible rough spots in the tale before he or she can notice or complain. Gene Wolfe proves there is another way. His writing is stamped by extraordinary grace. It flows so smoothly and clearly and evocatively that one is hardly aware that one is reading and not living.

If you wish proof of my claim, grab the first copy you see of **Lake of the Long Sun.** This is Volume 2 of Wolfe's "Starcrosser's Planetfall" series, and it amply fulfills the promise of its predecessor, *Nightside the Long Sun.*

Nightside set up a world, or "whorl," on the inner surface of a vast, cylindrical spaceship illuminated by a central "long sun." The protagonist was Patera Silk, an augur or priest in the city of Viron. Now, impelled by a vision of the Outsider, a god not in the conventional pantheon, Silk is still trying to raise the funds to buy his manteion, the school and temple over which he presides,

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back from a racketeer. As he proceeds, he displays an innocent, intelligent virtue that draws people to him. They are thieves, whores, ordinary people who crave an end to drought, to corrupt priesthoods, to an Ayuntamiento (governing council) that has done without a calde (chief) for twenty years. Soon "Silk for Calde" graffiti are appearing around Viron. The goddess of love appears in the manteion's Sacred Window (or computer monitor) and possesses a prostitute. Silk finds signs of espionage and intrigue and conspiracy, and then he hies off to Lake Limna to find a man he thinks he might be able to blackmail for the price of his manteion.

What he actually finds is something else again: the origin of the whorl three centuries past, the true nature of the gods, an affirmation of faith as a positive thing quite independent of those gods, a hint of the future (clearer to the reader than to Silk), a step upon the path of destiny, a conclusion (for this book only) marked by pungent irony, and an instant hunger for the next volume, *Calde of the Long Sun*, which should be available by the time you read this review.

Daniel Keys Moran has an ambitious plan: a thirty-volume saga, the Tales of the Continuing Time. If he lives long enough—and he may not, since I reviewed his last, *The Long Run*, in 1990—it should be a very impressive body of work.

The Last Dancer is the volume at hand. Set some time after *The Long Run*, it picks up the tale of Denice Castanaveras, one of only three survivors of the telepathic clan of "genies," or products of the genegineers' art. The rest were nuked. (One of the other survivors, Trent, was the central figure in *The Long Run*.) She has disguised her identity and nature for fear of discovery by the Unification, the UN's French-led global dictatorship. As the tale opens, she is leaving a feminist enclave to reenter public life, returning to an old martial arts mentor, seeking a position beside a UN official who plans to run for the head honcho's seat. Yet we immediately see that there are complications, some of which have their roots 37,000 years before, when a human Shield pursued a heretic Dancer high into the mountains and shot him with a weapon that convulsed his nervous system. The Dancer would have died then if he had been unable to activate a stasis bubble.

We are not surprised to learn that the bubble has been found and the Dancer healed. Perhaps we *are* surprised to find the Shield, Dvan, still around, still alert, still able to return to the Dancer's scent, and then again to learn that these ancient relicts are also characters in the Continuing Time, as are the time travelers who appeared in *The Long Run* and again here. Moran's saga obviously has immense reach.

The Dancer's name is Sedon. He escapes the Unification's confinement and soon emerges in a position of power in Occupied America. He is egging on a Tricentennial Revolution, even though the Unification expects it and is deliberately *not* stamping out

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the plotters. It seems that the head honcho, whom Denice's boss hopes to displace, is planning to use the rebellion as an excuse to impose martial law and cancel the coming election; no term limits for him.

Does it sound complicated? Bring on Ralf the Wise and Powerful, virtual-reality avatar of Trent. Bring on Ring, eldest of all the sentient artificial intelligences in the worldwide datanet. Bring on . . . oh, what the heck, bring on the clowns, and don't worry. Moran makes even that fit in as the conspiracies develop and the momentum builds and the Castaneveras clan hovers on the brink of extinction despite the occasional time-traveler's reassurance that Denice is their ancestress.

Do you want to know more about Shield and Dancer? Moran devotes considerable space to their background, despite the risk that many readers may feel it unnecessary, a distraction from the performance in the center ring. They *are* human, descended from humans taken from Earth long, long ago by a reptilian master race. They developed the Dance in their servitude, and when the master race vanished, they built a culture of their own based upon it. In that culture, both Sedon and Dvan were near immortal. They were also elite, but as a heretic Sedon was exiled to Earth with his followers. Dvan was one of the guards.

When the prisoners rebelled, the surviving guards hunted them down, though it took many millennia. In the end, so it seemed, only Dvan survived, while the prisoners' descendants were well on their way to becoming us, and the martial arts were developing as well, as faint shadows of the Dance.

There is heavy parallelism in the two accounts, not just in the rebellion against masters, but also in the Dance, for Denice's world has "webdancers," who skillfully cavort in cyberspace. Moran's lengthy digressions therefore do play a part in making his main tale resonate, and the whole becomes a marvelous entertainment.

I hope we won't have to wait so long for his next Tale of the Continuing Time.

It has been almost seven years since I reviewed Suzette Haden Elgin's last novel, *The Judas Rose*. That was the second volume of the "Native Tongue" trilogy, set in a future where women are once more chattel, property, needing the permission of the men in their lives to do anything at all. Only the women of the "Linguist Lines" have professions; they are highly skilled translators of alien tongues, and if they are just as oppressed as any other women, they are also independent manipulators who accomplish a great deal behind their men's backs. To aid their concealment and to escape the strictures of male language, they devise a new, feminine language, and they seem on their way to redressing the imbalances of society.

Perhaps Elgin was overcome by a fit of skepticism. The new volume, **Earthsong,** begins with the vanishing of the aliens. Humanity is left in chaos, for all the human economy

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was based on the continuation of trade with the aliens. The men are dithering. The Linguist women are at loose ends, for they no longer have translations to do.

Meet Delina Chornyak, who mourns the death of Nazareth Joanna Chornyak, famous for her wisdom. She undertakes a vision quest to find Nazareth in the afterworld, succeeds, asks, "What are we to do?" and learns that the aliens' departure is a response to human violence. Delina's assignment is to find a way to end that violence by ending human hunger. Later, she discovers in the archives accounts of ancient monks who subsisted on nothing more than water, an occasional handful of bitter herbs, and Gregorian chants, and realizes that food isn't really necessary. Music will do. In fact, the omnipresence of music in the second half of the twentieth century explains the commonness of obesity then. So all we have to do to solve hunger is teach everyone to sing and thereby generate all the calories they need both to keep singing and to do all the other things people do. And, oh, yes, we really must keep this secret from the men or they'll surely muck it up with their greed for wealth and power.

Earthsong plays out this tale as if it were told by Nazareth from beyond the veil, speaking through channelers (or mediums or trancers) who have a tendency to distort the true signal. This perhaps is why "audiosynthesis" is here at all—it is just as logic-defying as any other perpetual motion scheme, and it smells like something "New-Age" pudding-brains could actually believe in. The "true signal" has more to do with the roots of greed and violence in privation. As Elgin says in one of the "teaching stories" used by the women to spread audiosynthesis across the human worlds, "The hungry mouth is locked tight in Old Time; feeding it will not help. Feed it, and you will access the even older time when it hungered for raw meat and thirsted for blood." Find another way to satisfy the primal needs, and if you do not solve all humanity's problems, at least you have begun.

This makes sense. And Elgin says it with charm and beauty and grace (not too far short of Gene Wolfe's grace). Her prose is always a pleasure to read, and her messages are worthy of attention.

Unfortunately, this time she chose to express herself through a noisy channel. Audiosynthesis may be a cute notion, but it's enough of a stopper to make anyone with a shred of technical background pitch the book across the room.

If you're familiar with Ben Bova's "Orion" series, I don't need to say much more than: "Here's another—**Orion and the Conqueror.**" If you're not, well, the Orion tales feel a bit like Philip Jose Farmer's "World of Tiers" and "Riverworld" series, even though the stories are very different.

Here's the background: Orion was created by beings, who look a lot like gods, to go back in time and wipe out the Neanderthals in order to assure the evolution of ourselves and our eventual descendants, the Orion-makers. Orion, made to be strong,

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smart, resourceful, and immortal in a fashion, succeeded in his mission. One of his gods, Anya, fell in love with him and he with her. The other gods, either jealous or offended (she's guilty of loving the moral equivalent of a toaster, after all), tried to keep them apart. Yet their meddling with the past had unsettled the continuum, and Orion was needed to pull more chestnuts from the fire. More temporal missions ensued, he and his love were united, separated, reunited, again and again. The result was cosmic romance with the added charms of the historical novel, in many volumes instead of one, visiting many periods of history and prehistory.

The current volume takes the youth of Alexander the Great as its venue. Here is daddy Philip of Macedon struggling to build an empire. His wife, Queen Olympias, is actually one of Orion's gods, plotting to ensure Philip's death and Alexander's rise, all to build an empire and establish the trends that will lead to their own existence. Yet Orion likes Philip, and even though cooperating with the queen seems the only way to see his Anya ever again, he must struggle against the gods in the best classical tradition.

Bova says he hews close to the historical facts. Since I'm no historian, I have to take his word for that. What I can see for myself is that he has done a marvelous job with this tale. Indeed, it may be the best in the series.

Ian McDonald's previous work has included the literarily ambitious, polished, and quite readable novels *Out on Blue Six* and *The Broken Land*, among others. He's established himself as a man to watch, and it is therefore a pleasure to spot his name on a new title in the mailbox, even if it's no more than a novella.

It's **Scissors Cut Paper Wrap Stone.** Its setting is a future Japan where overcrowding and crass commercialism have buried the traditional paths of Shinto pilgrimage, and the pilgrims are far and few between. Yet here are two, making the round of the ancient shrines on bicycles. Masahiko, famous for his pop-culture animations, is the companion to the narrator, Ethan Ring, who has a curious way of concealing the palms of his hands. We gain a hint of why when they two, as holy pilgrims, are called on to attempt a healing, and again when they are attacked by cyborg dogs. Each time, Ethan reveals his palms and something tattooed on them, and each time he is victorious. Yet the open hand does not always win the game of the title; we are not surprised to find that Ethan has foes.

What is on Ethan's palms? What is on the slips of paper he can pull from his demon box? McDonald tells us of a student group enamored of the idea that there are archetypical icons to which great art only approaches. Each icon activates some mental or emotional response—rage, passion, amnesia, paralysis, and many more. And to find these icons, one need only use computers to extract common features from artworks. Then one can tweak them, find new ones, design weapons that destroy through

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the eyes. The project's ramrod died, a victim of his own vision. Ethan kept the icons for his own use, even though it cost him his love. Before long he had been co-opted by government as a super-agent, super-assassin.

He's not a happy camper. That's why he's on this pilgrimage, in search of his soul. He is thus living out a very traditional role, and in the end he finds something of a traditional peace.

Yet before he reaches that end, he does something that I felt rather spoiled the overall effect. Faced with corporate villainy, he uses his icons to achieve justice and in the process comes to seem the perfect adolescent acting out a fantasy of power. Later he chooses to relinquish that power, which is surely a large part of McDonald's point, but still I felt that McDonald was seizing a too-easy answer to the problems with which he confronted his protagonist. The tale turned thin and watery to my mind.

At that point, I looked back at the title and the gimmick and thought, "Cute, but not much more."

I now have to be careful about reviewing Bill Barton. He's done some very nice work (e.g., *Dark Sky Legion*), and I expect he'll do a great deal more. It's therefore a pleasure to have something of his to read. But some time back, we started corresponding, hit it off, began bouncing ideas back and forth, and now we're collaborating on a novel. It doesn't have a publisher yet, but our agent likes it and it's surely only a matter of time.

Well, it may not be that simple, the writing game being what it is, but at least you now know to expect me to have a bias in Barton's favor. That said, here's his latest, a chapbook called **Yellow Matter** that most editors (he said, frustratedly) just couldn't stomach. So he wound up with a publisher best known for strange horror.

The funny thing is, I can't see why he couldn't sell it to one of the major markets (he said, ingenuously). Or perhaps I can. Barton here sets up a fairly standard SF scene, a distant world occupied by a number of alien species, including humans. One alien species, the Bimus, is able to have a sexual relationship of sorts with human males, and here's the rub. Morley's girlfriend has just moved out. Morose, he wanders from bar to bar and winds up at a multispecies party where a Bimus puts a move on him: "Hi, sweet thing! You're so cute! Tell me about yourself. Let's go in the other room. There's a bed...." Morley tries to object, but Bimus (like BMOCs) are big and strong and overpowering. Call it date rape, complicated by a wad of cash Morley can really use. And when the Bimus comes back, it's not long before Morley quits his job and lets the alien take over the rent and other bills. Sadly, the Bimus eventually is transferred offworld. Morley tries to cope, but it proves very easy to start batting his eyes at other Bimus.

If the characters were all human, and it were a man seducing and ruining some young shop girl, the story might seem quite ordinary, even quaintly antique. As it is, it surely

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must make male readers uncomfortable while outraging feminists with his not-too-subtle hint that the ruinee could possibly accept his or her fate.

Will you like it? That depends, doesn't it? Just how liberal *are* you?

Mathematician Eric Temple Bell was also early SF writer John Taine. Under both names, he had a reputation for imagination and a gift for being far ahead of the pack. Indeed, as a mathematician he came up with a number of ideas that others— unaware of what he had done years before—gained the credit for inventing. As an SF writer, he had trouble getting his books published—twenty years in one case, and then the book was hailed as ground-breaking; just think how novel the tale was when he wrote it! As a poet—well, about that, the less said, the better. He also wrote *Men of Mathematics* (1937), a collection of biographical sketches that sold well and convinced many young people that a mathematician was just the sort of person to become.

Bell died in 1960, just a few weeks before he would have turned seventy-seven. By 1990, biographers were working on his story but having trouble finding the necessary time. They called in Constance Reid, well known for her biographies of mathematicians, and she immediately discovered puzzles: Just who was E. T. Bell, anyway? He gave several accounts of his education, his background, his origins. She began to dig, and she discovered a good deal of truth, including the rather surprising truth that Bell had turned his talent as a fictioneer to himself.

Reid's detective work, which resulted in **The Search for E. T. Bell,** makes a fascinating story. I found it especially so because it involved genealogical research, something on which I have been spending a certain amount of time myself. Here is how one tracks the past, discovering roots in Billingsgate, a father and grandfather who were fishcurers (they ran operations that gutted and pickled herring), the source of the "Temple" name, and a good deal more, including a never-mentioned brother who settled in Sri Lanka, and Lo! Reid was able to enlist Arthur C. Clarke's help in learning more about that fellow.

There is fascination aplenty in Bell's life and work as well. He was a complex human being, flawed like all of us, blessed with genius far beyond the norm. Women found him interesting, his son must surely have felt neglected at times, his colleagues generally (but not always) recall him with fondness or respect. His SF is largely forgotten, but in its day it was notable. His math varied in quality but overall was surely more notable than his fiction. And Reid supports these points quite well.

You'll love this one whether you're a mathematician or an SF fan. And surely you'll want to recommend it to your local town, high school, or college library.

Michael Whelan is one of those illustrators authors would kill to have assigned to do the covers of their books. I know that some who have enough clout to make demands of

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their editors have insisted on Whelan covers. When they actually got them, they could be heard chortling everywhere they went.

There are two reasons for this. One is that the authors believe Whelan covers sell books. They reach out to the potential reader pacing down the bookstore aisle and say, "Read me! You'll love me!" The other is that Whelan is *good.*

How good? Plunk down your sixty bucks for **The Art of Michael Whelan,** and you'll see. There's a generous sampling of Whelan covers here, along with interviews with Anne McCaffrey, Chicago gallery-owner Terry Booth, and artist David Cherry. There's also a very fine array of more personal works, done not to commission but to express his own concerns. Here we see Whelan the artist rather than Whelan the illustrator, and though his covers are quite impressive enough by any measure, it is among these "Visions" that I found my favorites, three evocative paintings called "Climber," "The Red Step," and "Causeway."

The total roster of artworks here is a hundred full-page paintings, including twenty-five new ones, and a hundred preparatory sketches and color studies (which give one something of a feel for how Whelan works). All together, they display a colossal talent and versatility, as well as a gift for saying so much more with shape and color than is on the surface that I would love to put "Climber," "The Red Step," and "Causeway" on the walls of my home. This is not something I can say for most artists, even ones whose work I admire.

And yes, I too would kill to have a Whelan cover. ■

(Biolog continued from page 157)
the characters and their lives quickly drive the writing. Marianne can't imagine how writers managed before word processors since they allow exploration of multiple avenues. Science and SF are like that, too, she thinks, developing the best solutions or at least pointing others in interesting directions. Marianne hasn't yet achieved her fifth-grade vision of being out in space, but like Wernher Von Braun before her, she aims for the stars. ■

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BRASS TACKS

Dear Stan:

I know that magazine logistics prevent true dialog from emerging in Brass Tacks. Nonetheless, I am moved to address five points raised by Rachel Lerner [Brass Tacks, Aug '93].

1. Regarding cancer rates, she asks "Why so many?" Answer: Because we are healthier. a) Everyone dies, so b) everyone must die of something. Since c) cancer is largely a disease of age and d) Americans (et al.) live longer, e) cancer rates in industrial societies will be high. BUT, the *age-adjusted* cancer rates are no higher here and now than elsewhere and elsewhen.

2. "Environmental causes" would leave a pattern in the cancer data. Odd clusters here or there do not count, since such clustering will occur by chance. Any overall environmental effect must be beneficial, since age-adjusted US cancer rates are *declining*, except for breast cancer in women [holding steady] and lung cancer in both sexes [exponential]. (From charts of long-term cancer trends presented by Nobel laureate Rosalyn Yalow at I-CON.) As for the lung cancers, female rates lagged males by about twenty years, even though men and women breathe the same air. Behavioral factors (such as cigarette smoking, which women took up about twenty years after men) seem more likely causes than environmental factors.

3. However . . . I do agree with Ms. Lerner that animal screening for carcinogens is invalid. [Not all animal testing, mind you. Some of the animal models are quite well-founded.] But about half of all chemicals, natural *and* human-made, fail the cancer screen. [I once knew someone who wouldn't believe a "natural" substance could be a "chemical." Chemicals are bad, you see; and natural is good. Oh, the pity . . .] Ms. Lerner worries that some human carcinogens may get a clean bill from animal testing; but we have spent billions in direct and hidden costs because of the converse: animal carcinogens with no epidemiological evidence that they cause cancer in humans. Alar is a recent example. Dioxin is another: it has *never* been linked to elevated cancer rates in humans, not even at Seveso, where a reactor explosion spewed a dioxin cloud over the village. Yet, we evacuated Love Canal and Times Beach at staggering cost. Yes, there were cancers at Love Canal, but no more than normal. [*Science*, Vol. 212, No. 4501, June 19,

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1981] If extrapolation from animal tests to humans is "bullshit," as Ms. Lerner contends, the rationale behind much of the Green agenda collapses!

4. That a group of sick people insists that "X" is the cause does not mean that "X" really is the cause. We must distinguish between a fact and a belief. Being sick does not qualify one as an epidemiologist, nor as a statistician. Our hearts go out to the sufferers, but contracting cancer does not confer expertise. In earlier times, frightened sufferers would blame fluoridation, or Jewish well poisoners, or "witches." Now they blame power lines or dioxin, microwave relays or cellular phones.

5. Ms. Lerner's final warning, that "the odds are excellent that one day you will get" cancer is absolutely true. My brother did, at sixteen. My mother did, just this year. In the US, one-fourth of us will contract cancer in our lifetimes and one-fifth of us will die of it, mostly lung cancer from smoking. How much more satisfying to blame someone, especially someone "bad," and most especially someone "bad" with lots of money, than to acknowledge mortality, random chance, genetics and behavior.

MIKE FLYNN

Dear Stan,

I really enjoyed "To Bring *Down* the Steel" by Doug Beason in the October 1993 issue. The physics and engineering implied are fascinating, but I do have one question: after all the talk of space debris (and especially "What Goes Around, Comes Around" by Canough and Lehman, in the March 1991 *Analog*), what does Dr. Beason plan to do with the 4.18 *billion* cubic meters of asteroid innards still in orbit? (I guess I'm assuming they can't actually remove the interior in one large chunk, and also that the Free Electron Laser does not have enough energy to actually vaporize that much rock.)

IAN RANDAL STROCK

The author replies. . . .

Dear Stan,

Mr. Strock has a valid point—what *do* we do with over 4 billion cubic meters of asteroid still in orbit? At a couple of thousand kilometers out, it won't affect the low-flyers we should have up by then, such as a constellation of cellular-phonesats. But getting through that debris on the way to higher orbits might be a problem, especially if the chunks break apart.

With enough prodding, I'm sure Ian could come up with one of his famous "Probability Zero" solutions. But as for me, if I had enough power, I'd melt the debris and "blow" it into a hollow sphere, like a glassblower; then I could bring it down as I did in the story.

Or then again, if I was Stu Mendez, I might throw rocks at Earth until they yelled uncle—like first Heinlein (*The Moon is A Harsh Mistress*), then Niven and Pournelle (*Footfall*) did.

Finally, in case your readers didn't catch it, the story was a thinly veiled kudos to Donald Kingsbury and *his Analog* story, published some years before; I had approached Don at BaltiCon in '92 about using his initials as well as the play on the title. As I

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pointed out in the story, this originated from an idea dreamed up by O-Division (thanks Rod!). All I did was to create the story.

DOUG BEASON

Dear Stan,

When we consider (a) the recent study concluding that (i) it is the presence of its relatively large Moon which prevents the inclination of the Earth from shifting too much (as compared to the other planets) and (ii) it was the relative moderation of such shifts that kept the Earth's climate sufficiently moderate to allow life to arise with (b) the current theory that the Moon was formed as the offshoot of a collision between Earth and a very large asteroid at a particular angle, then perhaps we begin to have an answer to the question as to why intelligent life in the Universe may be so rare.

Even if planets are the norm in star systems, if life depends on the creation of double-planets like the Earth-Moon within a stellar system temperate zone, and that further depends on celestial collisions of just the right size at just the right angle, then the probability of life arising may be a lot less than previously calculated.

JEFFREY G. LISS

Dear Stanley Schmidt and Tina Lee,

I thank God for writers who can weave so many faiths back to their common thread (Tom Ligon, "The Gardener," November '93) and I thank *you* for publishing it. I wish to echo Edith Tyson's letter referring to *ASF&F's* position on presenting religious beliefs in the same issue: "[You are] doing something right." I know that having and expressing faith is becoming fashionable again. While I do wish that *ASF&F* had been a little faster to welcome the future, as was pointed out in a past editorial, you can't publish what's not written! And, ever sensitive to the needs of the greater whole, those editorial essays are to our society's rush into tomorrow as the gentle nudges of a hydrazine rocket at mid-course correction are to a spacecraft's rendezvous with its destination.

Thank you again for doing your work so very well.

ROBERT VAN DE WALLE
Costa Mesa, CA

Good day, Dr. Schmidt:

One thing that makes *Analog* stand out as an SF magazine is your dedication to scientific rigor. While promoting good storytelling, you also seem very careful to choose stories that grow from current scientific knowledge. And I suspect you want to be just as rigorous when it comes to things other than science. But you can't know everything.

I noted your 11/93 cover with avid interest . . . and some trepidation. I remembered Tom Ligon's "The Devil and the Deep Black Void" (1/86); I'd enjoyed it and found Mr. Ligon a good and thought-provoking author, but felt he'd been off center in some interpretations of how the protagonist and other members of his community would think and act based on their Baha'i background. Still, interpretations are just that, and mine are not

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sacrosanct.

Hence my interest and trepidation regarding Mr. Ligon's sequel "The Gardener." Again I found it good and thought-provoking storytelling, and again I found myself disagreeing with some interpretations but willing to accept them for the sake of the story . . . after all, it's *his* story, not mine. But in section nine, I found such a blatant error in fact that I had to write.

Mr. Ligon states that ". . . the Baha'i teaching that mankind could comprehend God only through two 'perfect mirrors,' Christ and Baha'u'llah, rubbed Shiite fundamentalists the wrong way. Islam taught that there were no intercessors between man and God." Not true.

Like Baha'i, Islam teaches that God has sent us perfect Mirrors or Messengers or Teachers throughout the evolution of the human race. The Holy Quran praises Abraham, Moses, and Jesus as such teachers and honors their followers. But Muslim fundamentalists believe that Muhammad was the last such teacher; while Baha'is believe Baha'u'llah's claim that there will never be a *last* Teacher but that he himself is the *latest* . . . the fulfillment of Shia prophecy and the teacher for this era in mankind's development.

Furthermore, Baha'is do *not* believe there were only "two 'perfect mirrors,' Christ and Baha'u'llah"; and no child brought up in a Baha'i home, whether or not s/he ever chose to become Baha'i, would think they do. Baha'i Scripture instructs parents to expose their children to all the great religions and to make them aware of the unique mission and divine power of each Teacher. The Scripture names even more Teachers than those I've already mentioned—such as Zoroaster, Krishna, and Buddha, known by their extant Books—and further teaches that every people, place, and time has had its Teachers, but that most are no longer known because they left an oral, rather than a written, tradition. For example, Baha'u'llah's son and heir, 'Abdu'l-Baha, visited the US in 1911-12; and he told the Native Americans to look to their own tribal religious traditions and prophecies to determine where to turn for guidance in today's world.

Errors happen. Mr. Ligon is still a good and thought-provoking storyteller. Keep encouraging him to find stories to tell about his world of Mazra'ih and its colonists. And help him ensure that his religious "facts" are as rigorous as his science. I know the results will be worth reading.

LUCKI M. WILDER
7408 North Rogers
Chicago, IL 60626-1610

The author replies. . . .

Dear Stan:

My source for most of my information on the Baha'i Faith is a primer by J. E. Esselmont entitled *Baha'u'llah and the New Era.* I've tried to stick as faithfully to it as I could. Perhaps it is too limited in scope, or even inaccurate, but I suspect part of the problem is that it is a little dated. I keep having that last problem in studying Islam. My primary source for that, the Koran, is a little dated too (even in the

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spelling on the cover) and there seem to be a lot of modern ideas that I can find no hint of in the original. Esselmont cited Christ and Baha'u'llah as perfect mirrors; the word "only" may be an error, but the context certainly set them in a class by themselves, and he indicated that ordinary folk could not comprehend God without these reflections of Him. I'd love to receive recommendations for further (and more authoritative) reading on the Baha'i Faith.

I don't think I've made a mistake regarding the dim view the Koran takes of intercessors. Every page or two the reader is reminded, in no uncertain terms, that the sinner will face God directly on judgment day. Praying to saints, or claiming that you followed the advice of great teachers, will not protect you. While the Koran acknowledges Jesus as a revealer of God's teachings, it repeatedly decries the notion that he is the Son of God, the notion of the Trinity, and similar bits of Christian doctrine. I don't remember encountering the term "perfect mirror" anywhere in the Koran, nor support for the notion that any man is necessary for a believer to see and follow the Path. While prophets are certainly acknowledged, and good teachers are always appreciated, the revelations delivered through Muhammad (referred to as the Messenger, but not the Mirror) are considered to be quite sufficient by themselves, since God created them to be just that.

I certainly support the idea of learning about other religions. I hoped I had made it plain, especially at the end of the story, that Hab *had* studied many religions, and knew that, at their core teachings, the really great ones are generally remarkably similar in many important ways. Hab's view *is* decidedly "off-center," but characters whose views are dead center tend to be awfully hard to make interesting.

For "Devil" I needed some good spacefaring victims. Bahai's seemed to fit the bill since they were a) good, b) likely to be spacefaring, and c) prone to being victims. At the time I wrote it, they were, by all reports, being persecuted horribly by the Islamic Revolution in Iran. Not understanding *why* anyone would find a reason to persecute people who were evidently exceptionally peaceful, tolerant, and nonthreatening, I studied both religions.

Something about the Baha'i Faith evidently rubs at least a few supposed "Islamic" leaders the wrong way. In fact, I perceive quite a few significant differences, some of which seem, at least in some interpretations, to be incompatible. I don't think I'm far wrong in supposing the "perfect mirror" subject (two, twenty, or even one intercessor is too many) would be irksome to the very wrong-minded fellow I call "the Mihdi" who has been banished from Earth *and* the Islamic community. One thing is absolutely certain, however: the Koran condemns religious persecution. Those who practice it will spend eternity in a hell which is repeatedly described in excruciating detail. If the Baha'is are mistaken in their beliefs, God will take it up with them in

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due course, and it is not the business of good Muslims to go about killing them for it.

And before anyone writes me about *that*, I certainly don't think most Muslims *do*.

In any case, I wasn't trying to write a primer on the Baha'i Faith. I was trying to give a little something back to a troubled young man whom I had left in a difficult emotional situation from which it appeared there was no hope of escape.

Finally, I certainly *hope* I'm not correctly predicting the future in this case. Authors need problems to write about, or our stories fall flat. Science fiction authors tend to pick bigger problems than the average, and it tends to make many feel we have a gloomy outlook on the future. That is, of course, exactly the opposite of the focus of the Baha'i Faith, which teaches that we *can and will* achieve peace, and not particularly far in the future. I think science fiction *does* actually strive toward this goal as well, by creating models of the future. If these models (analogs) make us think carefully, perhaps we will build a better future. Remember, the *real* key to a story is not the *problem*, but how the characters *deal* with it.

TOM LIGON ■

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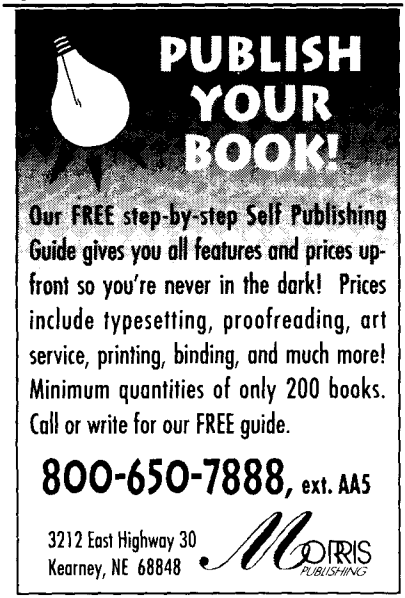
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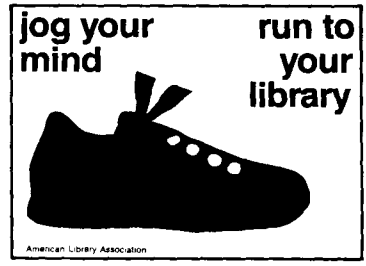

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UPCOMING EVENTS Anthony Lewis

27-30 May 1994
DISCLAVE '94 (Washington DC area SF conference) at Sheraton Premiere, Tysons Corners, Va. Guests of Honor—Lois McMaster Bujold and Steven Vincent Johnson, Special Guest—Darlene P. Coltrain. Registration—$30 until 30 April, $40 at the door (ages 6-12 $10, kids in tow $5, babes in arms free). Info: Disclave '94, John Sapienza, Box 677, Washington DC 20044.

27-30 May 1994
BAYCON '94 (Bay area SF conference) at Red Lion Hotel, San José, Calif. Guests of Honor—Diane Duane and Peter Morwood, Artist Guest of Honor—Rick Sternbach, Fan Guest of Honor—Ray Nelson, TM—Laura Brodian Freas. Registration—$40 until 13 May, $45 at the door. Info: Baycon '94, Box 10267, San José CA 95157.

17-19 June 1994
AD ASTRA 14 (Toronto area SF conference) at Sheraton Toronto East Hotel and Towers, Scarborough, Ont. Guests of Honor—Diane Duane and Peter Morwood. Registration—C$26 (US$22) until 15 May; C$32 (Canadian funds only). Info: Ad Astra 14, PO Box 7276, Station A, Toronto, Ontario CANADA M5W 1X9.

1-4 July 1994
WESTERCON 47/CONOZOIC (West Coast Regional Science Fantasy Conference) at Los Angeles Airport Hilton & Towers, Los Angeles, Calif. Guest of Honor—George R. R. Martin, Artist Guest of Honor—Real Musgrave, Fan Guest of Honor—William Rotsler. Registration—$45 until 31 December 1993. Info: Westercon 47, % SCIFI, Box 8442, Van Nuys CA 91409.

1-5 September 1994
CONADIAN (52nd World Science Fiction Convention) at Convention Centre, Winnipeg, Manitoba. Guest of Honour—Anne McCaffrey; Artist Guest of Honour—George Barr; Fan Guest of Honour—Robert Runté, TM—Barry Longyear. Registration—$125 (C$165), Supporting—$25 (C$30). This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: Conadian, Box 2430, Winnipeg MB R3C 4A7 Canada or Box 7111, Fargo ND 58109 (204) 942-9494; FAX (204) 942-3427.

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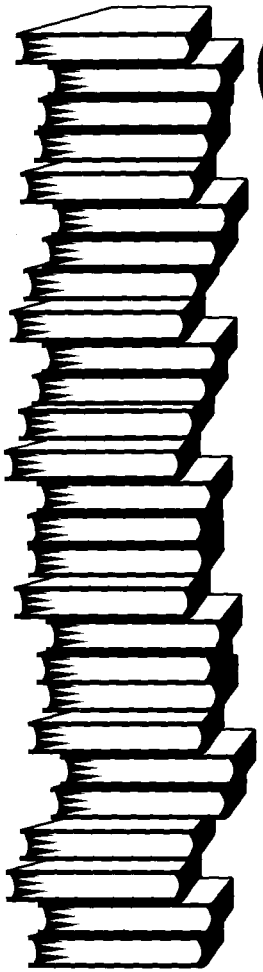

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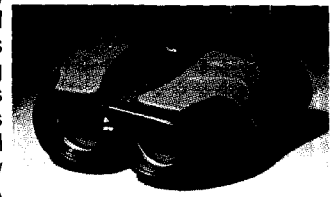

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